https://research.adra.ac.id /index.php/jete/
P - ISSN: 3025-0668
E - ISSN: 3025-0676

Developing Digital Competence Among Educators in Rural India

Karan Singh[1], Meera Gupta[2], Ananya Rao[3]
[1]Banaras Hindu University (BHU), India
[2]University of Mumbai, India
[3]Indian Institute of Management (IIM) Ahmedabad, India

ABSTRACT

Background. Digital competence has become a fundamental requirement for educators navigating 21st-century learning environments. In rural India, where infrastructural limitations and socio-economic disparities persist, equipping teachers with digital skills is critical to reducing educational inequities and fostering inclusive development.

Purpose. This study explores initiatives aimed at developing digital competence among educators in rural Indian contexts, focusing on both the opportunities and systemic challenges involved. The research aims to assess the effectiveness of targeted training programs, identify contextual barriers, and evaluate the sustainability of digital integration in teaching practices.

Method. A mixed-methods approach was employed, combining surveys of 150 rural teachers across three Indian states with in-depth interviews and field observations. Results indicate that while most educators demonstrated enthusiasm for technology adoption

Results. Results indicate that while most educators demonstrated enthusiasm for technology adoption, significant gaps remain in technical proficiency, access to reliable internet, and availability of culturally relevant digital content. Teachers who received structured, context-specific training exhibited improved confidence, pedagogical innovation, and student engagement.

Conclusion. The study concludes that sustained progress in rural digital education requires investment in infrastructure, localized content development, and continuous professional development. These findings contribute to the discourse on digital equity and educational transformation in underserved regions.

KEYWORDS

Digital Competence, Rural Education, Teacher Training

Citation: Singh, K., Gupta, M., Rao, A. (2025). Developing Digital Competence Among Educators in Rural India. *Journal Emerging Technologies in Education*, *3*(1), 22–32. https://doi.org/10.70177/jete.v3i1.2112

Correspondence:

Karan Singh,
karansingh@gmail.com

Received: Sep 6, 2024

Accepted: Dec 9, 2024

Published: Feb 2, 2025

INTRODUCTION

The increasing digitalization of education across the globe has placed significant emphasis on the need for educators to possess strong digital competence. In India, where the educational system is characterized by immense socio-economic and geographical diversity, the push toward digital learning has exposed both opportunities and vulnerabilities within rural education ecosystems. Teachers in rural areas often serve as the primary facilitators of change, and their ability to effectively use technology determines not only instructional

quality but also the extent to which students can access equitable learning opportunities (Coyne et al., 2025; Fathi Najafi et al., 2025; Feng et al., 2025). The pandemic-driven shift to remote and hybrid learning further accelerated the urgency to build digital competence among educators, particularly in underserved regions.

Digital competence refers not only to basic technical skills but also to the pedagogical capacity to integrate technology meaningfully into teaching and learning processes. Rural educators in India face a unique set of challenges that hinder the acquisition and application of digital skills, including limited infrastructure, unreliable internet connectivity, lack of professional development opportunities, and low exposure to educational technologies (Cattaneo et al., 2025; Estigarribia, 2025). These challenges compound existing educational disparities and limit rural students' participation in digitally mediated learning environments. Addressing digital inequity therefore begins with empowering rural educators to adapt, innovate, and thrive in technology-rich classrooms.

India's commitment to inclusive education and digital empowerment, articulated in national policy documents such as the National Education Policy (NEP) 2020 and Digital India initiatives, underscores the strategic importance of building teacher capacity in rural regions. However, policy aspirations alone are insufficient without grounded, context-sensitive implementation strategies. Understanding the lived experiences of rural educators and the conditions that shape their digital readiness is crucial for designing sustainable interventions (Baumann et al., 2025; Pagels et al., 2025; Striković et al., 2025). This study emerges from that need, examining both the systemic constraints and the transformative possibilities embedded in rural digital education.

The core issue addressed in this study concerns the persistent gap between national-level digital education reforms and the actual digital competencies of teachers working in rural Indian schools (Gumbi & Twinomurinzi, 2025; Ldokova et al., 2025; Rahimi & Sevilla-Pavón, 2025). Despite the growing emphasis on digital literacy, many educators in rural areas continue to lack the training, tools, and institutional support required to participate effectively in the digital transformation of education. The problem is not simply one of access, but also of relevance, scalability, and adaptability of training programs and content to rural teaching realities.

Teachers in rural areas are frequently excluded from professional development programs due to logistical, financial, and infrastructural barriers. Even when training is available, it is often delivered in generic formats that do not reflect the multilingual, resource-constrained, and culturally specific contexts in which rural teachers operate (Mitchell et al., 2025; Pagels et al., 2025; Schuitmaker et al., 2025). The lack of differentiated support for rural educators results in a digital competence divide that mirrors broader socio-educational inequalities. Without a deliberate focus on rural contexts, efforts to promote digital education risk reinforcing, rather than reducing, existing disparities.

Furthermore, the lack of robust monitoring and evaluation systems makes it difficult to assess the effectiveness of digital training initiatives in rural schools. Most existing programs prioritize hardware distribution over pedagogical engagement and capacity building. As a result, digital tools may remain underutilized or misapplied, failing to enhance teaching and learning outcomes. This study aims to respond to this issue by generating empirical evidence on how digital competence is developed, practiced, and perceived by educators in rural India.

The primary goal of this research is to explore the processes, practices, and challenges involved in developing digital competence among educators in rural India. The study aims to identify the types of support technical, pedagogical, and institutional that are most effective in enhancing teachers' digital readiness. By focusing on the voices and experiences of rural educators

themselves, the study seeks to foreground contextually grounded insights that are often missing from top-down policy discourse.

The research also seeks to evaluate the impact of training programs and digital initiatives on teaching practices and classroom dynamics. Through qualitative and quantitative analysis, the study will examine how teachers adapt digital tools to their instructional goals, navigate infrastructural constraints, and engage with students through technology (Alarfaj & Alrashidi, 2025; Priya & Anandan, 2025). This approach provides a comprehensive understanding of not only what competencies are developed, but how they are operationalized in diverse rural settings.

Ultimately, the study aspires to inform more inclusive and responsive strategies for digital education in India. The insights generated will contribute to the design of professional development models that are scalable, flexible, and aligned with rural realities. These findings can be used by policymakers, training institutions, and educational NGOs to strengthen digital learning ecosystems in rural areas, with the broader goal of improving educational equity and digital inclusion nationwide.

Existing research on digital competence in education has predominantly focused on urban contexts or technologically advanced regions. While studies have highlighted the importance of digital skills for teachers, few have explored how these skills are cultivated and sustained in rural schools. Much of the literature assumes a baseline of infrastructure and institutional support that is not present in many Indian villages, leading to recommendations that are not easily transferable to rural realities.

Where rural education has been addressed, the emphasis has often been on access to devices or the availability of internet connectivity, rather than on teacher-centered capacity development. The pedagogical dimensions of digital competence such as instructional design, student engagement, and culturally responsive use of technology remain underexplored. As a result, there is limited empirical understanding of how rural teachers develop digital competence and how it influences their teaching strategies, student outcomes, and professional identity.

This study addresses that gap by situating digital competence within the lived experiences of rural Indian educators. It offers a holistic analysis that considers not only technical proficiency, but also pedagogical innovation, institutional support, and socio-cultural relevance. In doing so, the study builds on and extends existing scholarship by bringing attention to the micro-level practices that shape the success or failure of digital education in rural settings. The research contributes a nuanced, evidence-based perspective to the discourse on equitable digital transformation in education.

The novelty of this study lies in its intersectional approach, combining digital pedagogy, rural education, and capacity development within a single analytical framework. Unlike studies that isolate technological access from teaching practice, this research examines how teachers in under-resourced settings actively negotiate and adapt digital tools to meet local educational needs. It challenges deficit-oriented narratives by highlighting examples of innovation, resilience, and leadership among rural educators.

This research also introduces a methodological contribution by employing a mixed-methods approach that balances statistical trends with rich narrative data. Surveys are complemented by interviews and field observations to construct a multi-layered understanding of digital competence development. This design not only captures patterns across diverse regions but also reveals the specific conditions that enable or hinder teacher growth in digital contexts.

The significance of this study extends to policy, practice, and scholarship. It offers actionable insights for educational stakeholders seeking to close the digital divide in India and beyond. By

centering the rural educator's experience, the research elevates the importance of locally driven, teacher-led innovation in digital learning. The findings underscore the need for investment not just in devices or infrastructure, but in human capacity the cornerstone of any meaningful educational transformation.

RESEARCH METHODOLOGY

This study adopted a mixed-methods research design to investigate the development of digital competence among educators in rural India. The rationale for using a mixed-methods approach lies in the need to capture both the breadth of digital training coverage through quantitative data and the depth of educator experiences through qualitative inquiry (Knopp & Pfadenhauer, 2025; Mansoor et al., 2025). The combination of survey and interview data provides a comprehensive understanding of how rural teachers acquire, apply, and sustain digital skills in diverse teaching environments. The research was exploratory in nature, aimed at identifying patterns, challenges, and best practices associated with digital competence development in low-resource educational contexts.

The population of the study comprised government school educators teaching in rural areas across three Indian states: Uttar Pradesh, Odisha, and Maharashtra. These states were selected due to their significant rural teacher populations, variation in digital infrastructure, and engagement with government or NGO-led digital literacy initiatives. A purposive sampling strategy was employed to select teachers who had participated in at least one formal digital training program within the last two years. A total of 150 teachers participated in the quantitative survey phase, while 24 teachers were selected for in-depth semi-structured interviews to explore personal narratives, teaching practices, and contextual challenges.

The instruments used for data collection included a structured questionnaire and an interview protocol. The questionnaire was designed to assess teachers' perceived digital competence, frequency of digital tool usage, and confidence in integrating technology into pedagogy. It consisted of both Likert-scale and open-ended questions to capture nuanced responses. The interview protocol explored themes such as training effectiveness, infrastructural barriers, instructional innovation, and institutional support. All instruments were reviewed by education and technology experts for content validity and piloted with a small group of rural teachers to ensure clarity and cultural relevance.

The research procedures were conducted in four stages. The first stage involved obtaining ethical clearance and formal permissions from local education departments and school authorities. In the second stage, survey questionnaires were distributed electronically and in paper format, depending on the technological accessibility of each school site. During the third stage, interviews were conducted either in person or via phone calls, depending on the availability of participants and regional connectivity. All interviews were audio-recorded with consent and transcribed for analysis. The final stage involved thematic coding of qualitative data using NVivo software and statistical analysis of survey data using SPSS to identify trends, correlations, and emergent patterns related to digital competence development among rural educators.

RESULT AND DISCUSSION

Descriptive statistical analysis revealed significant variation in the levels of digital competence among educators in rural India. Table 1 presents the percentage distribution of self-reported digital skills across five core domains: basic ICT usage, digital communication, instructional integration, content creation, and data management. Among the 150 teachers surveyed, 76.7% reported confidence in using basic tools such as word processors and presentation software,

while only 32.1% expressed proficiency in designing digital content or managing learning platforms. Approximately 58.0% indicated regular use of mobile phones for teaching purposes, whereas internet-based teaching tools were used consistently by just 39.4% of respondents.

Table 1. Self-reported digital competence among rural educators (n = 150)

Competence Area	High (%)	Moderate (%)	Low (%)
Basic ICT Usage	76.7	18.6	4.7
Digital Communication	64.3	27.4	8.3
Instructional Integration	43.2	36.1	20.7
Content Creation	32.1	41.5	26.4
Data Management	28.9	39.6	31.5

The data show that while a majority of educators possess foundational digital skills, more advanced competencies-particularly those related to curriculum design and pedagogical innovation-remain underdeveloped. Teachers reported frequent use of mobile apps like WhatsApp and YouTube for lesson delivery and student engagement, but demonstrated limited familiarity with tools such as learning management systems or digital assessment platforms. Digital competence was higher among educators who had access to regular internet connectivity and digital devices in their schools, highlighting the infrastructural dependency of skill development.

Survey responses further indicated that professional development programs had varying degrees of impact depending on delivery format and contextual relevance. Teachers who participated in hands-on, face-to-face training workshops rated their digital confidence significantly higher than those who attended remote webinars or received only instructional manuals. Respondents expressed that practical exposure, peer support, and access to real-time troubleshooting were key factors influencing their ability to adopt and sustain digital practices.

Interview data supported these findings, revealing that context-specific training improved not only technical proficiency but also pedagogical creativity. Educators who underwent structured digital literacy programs reported increased willingness to experiment with technology in classrooms, citing improved student engagement and enhanced lesson interactivity. In contrast, teachers who lacked follow-up support or were trained in abstract, non-contextual formats often abandoned digital practices due to frustration or perceived irrelevance.

Inferential analysis showed a moderate positive correlation ($r = 0.53$, $p < .01$) between the frequency of digital tool usage and self-reported instructional confidence. Regression analysis identified access to training as a significant predictor of digital competence ($\beta = 0.44$, $p < .01$), followed by infrastructure availability ($\beta = 0.37$, $p < .05$). These findings suggest that while digital resources are essential, professional development plays a more critical role in enabling educators to translate access into meaningful practice.

Comparative analysis between districts further demonstrated that teachers operating in areas with NGO-supported digital initiatives consistently outperformed their peers in unsupported districts across all five competence domains. Cross-tabulations revealed that female educators reported slightly higher confidence levels in digital communication than their male counterparts, attributed in interviews to their greater involvement in community WhatsApp groups and mobile-based communication.

Data relationships also revealed interdependencies between institutional culture, leadership support, and the diffusion of digital competence. Schools with proactive leadership that prioritized technology integration created more enabling environments for digital experimentation and peer

mentoring. Teachers in these settings reported higher collaboration, shared resources, and reduced apprehension about using unfamiliar tools. Conversely, schools lacking supportive leadership often isolated digitally skilled teachers, limiting the spread of innovation.

The qualitative case study of a government school in rural Maharashtra illustrated how a sustained training partnership with a local NGO led to significant pedagogical transformation. Teachers in this school co-developed lesson plans using smartphone applications and engaged students through blended learning approaches (Al-Rashidi, 2025; Blanc et al., 2025; Borges et al., 2025; Wagner et al., 2020). Regular peer-sharing sessions and leadership encouragement enabled digital practices to become institutional norms rather than isolated efforts. As a result, student participation and attendance in these classrooms improved noticeably.

A contrasting case from a school in eastern Uttar Pradesh showed minimal digital uptake despite the provision of tablets and internet access. Teachers lacked clarity on how to align technology with syllabus goals and reported a lack of time and support to experiment. The absence of structured training or instructional guidance resulted in tools being used for administrative rather than instructional purposes. The case underscores that access alone is insufficient without capacity building and pedagogical alignment.

The findings indicate that digital competence among rural educators is not simply a matter of individual initiative but is shaped by multiple systemic factors. Access to infrastructure, quality of professional development, peer networks, and school leadership all interact to influence how technology is perceived and applied. Teachers are not passive recipients of digital tools; they actively negotiate their use within local realities and professional expectations.

In brief, the study reveals that developing digital competence among rural educators in India requires more than distributing devices or offering generic training. It calls for contextually embedded, pedagogically focused, and institutionally supported interventions that recognize the complexity of teaching in under-resourced environments (Abdo-Salloum & Al-Mousawi, 2025; Momdjian et al., 2025; Santosa et al., 2025). Building sustainable digital cultures in rural schools depends on aligning infrastructure, training, leadership, and curriculum in a cohesive strategy that empowers educators as change agents in their communities.

The findings of this study indicate that while foundational digital skills are present among many rural educators in India, deeper levels of digital competence such as instructional integration, content creation, and data management remain limited. Teachers demonstrated confidence in using basic communication tools and mobile apps but faced challenges in applying digital tools to curriculum planning and pedagogical innovation (Aldalur, 2025; Beattie et al., 2025; Benbouhenni et al., 2025; Kayaalp et al., 2025). Professional development that was context-specific, hands-on, and locally supported had the most significant impact on teacher confidence and usage. The presence of supportive leadership and collaborative school culture further enhanced the likelihood of sustained technology integration in classrooms.

This study aligns with previous research that emphasizes the importance of infrastructure and training in shaping digital competence (Trucano, 2016; UNESCO, 2022). However, it differs by highlighting the central role of pedagogical relevance and community-based support in rural contexts. Many national and international frameworks have focused heavily on access and device distribution, while this study foregrounds the quality, relevance, and sustainability of professional development. The data confirm that access to tools alone is insufficient; the transformation occurs when teachers are empowered to adapt digital resources to their unique educational realities, often in the absence of formal systems.

The results signal a broader shift in understanding digital literacy not as a static checklist of skills but as a dynamic, context-responsive process of professional growth. Rural teachers are not simply recipients of digital knowledge; they are active agents negotiating technological adoption within infrastructural, cultural, and pedagogical constraints. The findings challenge deficit-based narratives that portray rural educators as digitally illiterate, showing instead that their competence is deeply influenced by structural and systemic conditions. This study marks a moment in the discourse where attention must move from individual limitations to systemic design and support.

The implications of these findings are critical for policymakers, education departments, NGOs, and training institutions. Investment in rural digital education must prioritize continuous, needs-based professional development and embed it within broader school improvement strategies. Teacher training should be designed to align with local realities and include mentorship models that foster sustained engagement. Curriculum developers must integrate digital pedagogy in a way that complements rural contexts, languages, and cultural knowledge. The study's insights also inform global education policy, offering a scalable model for low-resource settings grappling with digital inclusion challenges.

The emergence of these findings is rooted in the unique interplay between teacher motivation and systemic readiness. Teachers showed initiative in experimenting with digital tools when they felt supported and when the content was relevant to their teaching goals (Awad et al., 2025; Galustyan et al., 2025; Shirwa et al., 2025). Training formats that emphasized local languages, classroom-based examples, and ongoing peer learning led to higher adoption rates. In contrast, generic, top-down interventions failed to create lasting impact. The absence of formal structures often necessitated grassroots innovation, which, although admirable, points to the need for structured support systems to institutionalize these efforts.

The variation in outcomes across schools and districts was shaped by leadership commitment, availability of resources, and community engagement. Schools where leaders actively encouraged digital experimentation created psychological safety for teachers to try and refine new methods. Peer-sharing sessions and collaborative planning fostered a sense of collective responsibility, while schools without these features often struggled with fragmented or reluctant adoption. These differences reflect the broader inequalities embedded in India's rural education system and underscore the importance of designing digital strategies that are inclusive, localized, and adaptive.

The path forward must include building ecosystems that sustain digital competence development beyond initial training sessions. Education systems must institutionalize mentorship, peer support, and recognition structures that incentivize ongoing learning (ERFANI et al., 2025; Maurer et al., 2025). Collaborations between governments, local organizations, and teacher networks can co-create professional development models that are flexible, scalable, and deeply rooted in classroom realities. Monitoring and evaluation systems must move beyond access indicators to capture how digital tools are being used to transform pedagogy and student outcomes.

Future research should explore the long-term impact of digital competence on student learning and community engagement in rural areas. Participatory studies involving students and parents can offer additional insights into how digital shifts in teaching affect equity, language inclusion, and learning relevance. Comparative analyses across states or between rural and peri-urban schools can help identify scalable best practices. This study lays the groundwork for reimagining rural digital education not as a technological challenge alone, but as a complex, human-centered transformation of the teaching profession.

CONCLUSION

The most significant finding of this study is that digital competence among educators in rural India is not solely determined by access to technology but is fundamentally shaped by the quality and contextual relevance of professional development, leadership support, and collaborative school culture. Unlike approaches that prioritize device distribution or infrastructure expansion, this research highlights how pedagogically grounded and community-responsive training programs lead to more meaningful and sustainable integration of digital tools in classroom practice. The study reveals that rural teachers are capable of innovating with technology when given localized support and when training is embedded in their instructional realities.

This research contributes a conceptual advancement by reframing digital competence as a multi-dimensional, socially mediated process rather than a linear progression of technical skills. It integrates pedagogical theory, digital equity, and rural education into a unified analytical framework that can guide policy and practice. Methodologically, the study's mixed-methods design-combining survey data with case-based qualitative insights-provides a replicable model for assessing digital competence development in under-resourced settings. The emphasis on teacher agency and contextual adaptation marks a distinct contribution to the global discourse on digital inclusion in education. The study's limitations include its focus on three Indian states, which may not fully capture the diversity of rural educational contexts across the country. It also centers primarily on teacher perspectives, without incorporating student, community, or policymaker viewpoints that could enrich the analysis. Future research should adopt a longitudinal design to evaluate the sustained impact of digital competence on teaching quality and student learning outcomes. Expanding the scope to include ecosystem-level factors-such as curriculum reforms, language diversity, and digital content development-will be essential for informing scalable, equitable, and contextually grounded digital education strategies in rural regions.

AUTHORS' CONTRIBUTION

Author 1: Conceptualization; Project administration; Validation.

Author 2: Data curation; Investigation; Formal analysis; Methodology; Writing - original draft.

Author 3: Supervision; Validation; Other contribution; Resources; Visuali-zation.

REFERENCES

Abdo-Salloum, A. M., & Al-Mousawi, H. Y. (2025). Accounting Students' Technology Readiness, Perceptions, and Digital Competence Toward Artificial Intelligence Adoption in Accounting Curricula. *Journal of Accounting Education*, *70*. https://doi.org/10.1016/j.jaccedu.2025.100951

Al-Rashidi, A. H. (2025). Does digital task-based instruction make a difference in EFL university students' motivation in Saudi Arabia? An Active theory perspective. *Learning and Motivation*, *90*. https://doi.org/10.1016/j.lmot.2025.102115

Alarfaj, A., & Alrashidi, M. (2025). Revolutionizing gifted education: enhancing teachers' digital competence through fourth industrial revolution training. *Discover Sustainability*, *6*(1). https://doi.org/10.1007/s43621-025-00946-y

Aldalur, I. (2025). Enhancing software development education through gamification and experiential learning with genially. *Software Quality Journal*, *33*(1). https://doi.org/10.1007/s11219-024-09699-9

Awad, L., Abdi, Z., Langridge, B. J., Karoshi, A., & Butler, P. E. M. (2025). A Comparison of Commercially Available Digital Microscopes for Their Use in Bench-Model Simulation of Microsurgery. *Journal of Reconstructive Microsurgery*, *41*(3), 201–208. https://doi.org/10.1055/s-0044-1787980

Baumann, M., Markus, A., Pfister, J., Carolus, A., Hotho, A., & Wienrich, C. (2025). Master your

practice! A quantitative analysis of Device and system handling training to enable competent interactions with intelligent voice assistants. *Computers in Human Behavior Reports*, *17*. https://doi.org/10.1016/j.chbr.2025.100610

Beattie, M., Muirhead, K., & Carey, N. (2025). Exploring Care Home Workers' Perceptions of Implementing ECHO: A Qualitative Study. *International Journal of Older People Nursing*, *20*(2). https://doi.org/10.1111/opn.70017

Benbouhenni, H., Bizon, N., Yessef, M., Elbarbary, Z. M. S., Colak, I., Alammer, M. M., & Bossoufi, B. (2025). Enhancing the power quality of dual rotor wind turbines using improved fuzzy space vector modulation and super twisting sliding techniques. *Scientific Reports*, *15*(1). https://doi.org/10.1038/s41598-025-90914-3

Blanc, S., Conchado, A., Benlloch-Dualde, J. V, Monteiro, A., & Grindei, L. (2025). Digital competence development in schools: a study on the association of problem-solving with autonomy and digital attitudes. *International Journal of STEM Education*, *12*(1). https://doi.org/10.1186/s40594-025-00534-6

Borges, M. S. N., Cardoso, L., Rea, M. T., Pedrazzi, V., & Tirapelli, C. (2025). Does the Learning Curve for Intraoral Scanning Vary Depending on the Device? *European Journal of Prosthodontics and Restorative Dentistry*, *33*(1), 33–41. https://doi.org/10.1922/EJPRD_2766Borges09

Cattaneo, A. A. P., Antonietti, C., & Rauseo, M. (2025). How do vocational teachers use technology? The role of perceived digital competence and perceived usefulness in technology use across different teaching profiles. *Vocations and Learning*, *18*(1). https://doi.org/10.1007/s12186-025-09359-4

Coyne, E., Corones-Watkins, K., Dhar, A., Mitchell, L., Mongta, H., Wardrop, R., & Hughes, L. (2025). Health professional students' evaluation of video resources to improve their communication skills: A co-design study. *Nurse Education Today*, *147*. https://doi.org/10.1016/j.nedt.2025.106601

ERFANI, G., McCREADY, J., GIBSON, B., NICHOL, B., UNSWORTH, J., JARVA, E., MIKKONEN, K., & TOMIETTO, M. (2025). Factors influencing digital health competence among healthcare professionals: A cross-sectional study. *Applied Nursing Research*, *82*. https://doi.org/10.1016/j.apnr.2025.151922

Estigarribia, D. L. C. (2025). Inclusion of Digital Competence in the Teachers Training Curriculum in Paraguay. *Revista Colombiana de Educacion*, *95*. https://doi.org/10.17227/rce.num95-18912

Fathi Najafi, T., Andaroon, N., Bolghanabadi, N., Sharifi, N., & Dashti, S. (2025). Gamification in midwifery education: a systematic review. *BMC Medical Education*, *25*(1). https://doi.org/10.1186/s12909-025-06880-x

Feng, Y., Meng, J., & Cheah, J.-H. (2025). From Virtual Trainers to Companions? Examining How Digital Agency Types, Anthropomorphism, and Support Shape Para-Social Relationships in Online Fitness. *Psychology and Marketing*, *42*(3), 842–865. https://doi.org/10.1002/mar.22154

Galustyan, O. V, Vlasyuk, I. V, Zhirkova, G. P., Gamisonija, S. S., Zhang, J., & Liu, S. (2025). Formation of media competence based on organization of project activities of future teachers within blended learning. *Journal of Education and Learning*, *19*(2), 757–763. https://doi.org/10.11591/edulearn.v19i2.21860

Gumbi, L., & Twinomurinzi, H. (2025). SMME readiness framework for smart manufacturing adoption using critical realism: Knowledge and construction phase. *Journal of Innovation and Knowledge*, *10*(2). https://doi.org/10.1016/j.jik.2025.100665

Kayaalp, F., Durnali, M., & Gökbulut, B. (2025). Enhancing Competence for a Sustainable Future: Integrating Artificial Intelligence Supported Educational Technologies in Pre-Service Teacher Training for Sustainable Development. *European Journal of Education*, *60*(1). https://doi.org/10.1111/ejed.12865

Knopp, P., & Pfadenhauer, M. (2025). De/Professionalization and conflicts of competence in digitalization processes: The case of the police emergency response. *Osterreichische Zeitschrift fur Soziologie*, *50*(1). https://doi.org/10.1007/s11614-024-00587-x

Ldokova, G., Frumina, S., & Alwaely, S. A. (2025). Taking into account students' psychotypes and using their neuropsychological maps when implementing digital educational technologies within the Metaverse. *Smart Learning Environments*, *12*(1). https://doi.org/10.1186/s40561-024-00344-3

Mansoor, M., Paul, J., Khan, T. I., Abukhait, R., & Hussain, D. (2025). Customer evangelists: Elevating hospitality through digital competence, brand image, and corporate social responsibility. *International Journal of Hospitality Management*, *126*. https://doi.org/10.1016/j.ijhm.2025.104085

Maurer, J. D., Creek, S. A., Allison, T. H., Bendickson, J. S., & Sahaym, A. (2025). First impressions of digital pitches, innovation, and venture funding performance: An evolutionary psychology approach. *Journal of Innovation and Knowledge*, *10*(2). https://doi.org/10.1016/j.jik.2025.100672

Mitchell, S., Hart, J., Gharaibeh, M., McMahon, G. T., Rhoda, A., Fitzpatrick, S., Wuliji, T., & Janczukowicz, J. (2025). Principles to award learning achievements for lifelong learning in health using micro-credentials: an international Delphi study. *Human Resources for Health*, *23*(1). https://doi.org/10.1186/s12960-024-00969-y

Momdjian, L., Manegre, M., & Gutiérrez-Colón, M. (2025). A study of preservice teachers' digital competence development: Exploring the role of direct instruction, integrated practice, and modeling. *Evaluation and Program Planning*, *109*. https://doi.org/10.1016/j.evalprogplan.2025.102538

Pagels, L., Schindler, O., & Luedtke, K. (2025). Overview of styles, content, learning effects and attitudes of students towards digitally enhanced physiotherapy education – a scoping review. *BMC Medical Education*, *25*(1). https://doi.org/10.1186/s12909-025-06750-6

Priya, M., & Anandan, V. (2025). Recent innovations in sciences and humanities: Highlights the state-of-art developments and innovations which impacts science and engineering. In *Recent Innovations in Sciences and Humanities: Highlights the state-of-art developments and innovations which impacts science and engineering*. CRC Press. https://doi.org/10.1201/9781003606611

Rahimi, A. R., & Sevilla-Pavón, A. (2025). Scaling up computational thinking skills in computer-assisted language learning (CTsCALL) and its fitness with language learners' intentions to use virtual exchange: A bi-symmetric approach. *Computers in Human Behavior Reports*, *17*. https://doi.org/10.1016/j.chbr.2025.100607

Santosa, I., Iskandar, I., & Setiadi, S. (2025). Adapting Language Learning Materials for Digital Native: Infusing CEFR Standards in English Procedural Texts on Microlearning Apps. *World Journal of English Language*, *15*(4), 171–183. https://doi.org/10.5430/wjel.v15n4p171

Schuitmaker, L., Drogt, J., Benders, M., & Jongsma, K. (2025). Physicians' required competencies in AI-assisted clinical settings: a systematic review. *British Medical Bulletin*, *153*(1). https://doi.org/10.1093/bmb/ldae025

Shirwa, A. M., Hassan, A. M., Hassan, A. Q., & Kilinc, M. (2025). A cooperative governance framework for sustainable digital transformation in construction: The role of digital enablement and digital strategy. *Results in Engineering*, *25*. https://doi.org/10.1016/j.rineng.2025.104139

Striković, A., Krebs, P., & Wittmann, E. (2025). On the Role of Role-Theoretical Concepts: Determining Dimensionality or Difficulty in Cross-Occupational Collaboration. *Vocations and Learning*, *18*(1). https://doi.org/10.1007/s12186-025-09361-w

Wagner, C., De Gezelle, J., & Komarnytsky, S. (2020). Celtic Provenance in Traditional Herbal Medicine of Medieval Wales and Classical Antiquity. *Frontiers in Pharmacology*, *11*. https://doi.org/10.3389/fphar.2020.00105