OPTIMIZING THE ROLE OF EDUCATORS IN DEVELOPING THE PROGRESS OF DIGITAL TECHNOLOGY-BASED EDUCATIONAL INSTITUTIONS

Andi Asrijal[1], Raden Ajeng Indrawati[2]
[1,2)] Universitas Cahaya Prima, Indonesia
e-mail: andiasri1397@gmail.com[1], ajengindrawati@gmail.com[2]

Abstract
Integrating technology in education is crucial in the digital era to create a dynamic and effective learning environment. However, successfully implementing digital tools depends on educators' roles and abilities. This community service empowers educators to integrate digital technology into their teaching practices effectively. This service method uses Participatory Action Research (PAR), which includes a series of collaborative workshops and the formation of a Professional Learning Community (PLC). These workshops provide hands-on training on digital tools, while PLCs offer a platform for ongoing peer support, knowledge sharing, and collaborative problem-solving. The service results show a significant increase in educators' self-confidence and proficiency in digital technology. Additionally, PLCs play a critical role in sustaining this progress by fostering a culture of continuous learning and innovation. The project also observed positive impacts on student engagement and learning outcomes, demonstrating the benefits of effective digital integration in education. In conclusion, this project highlights the importance of targeted professional development and ongoing support for educators in the digital transformation of educational institutions. Addressing resource gaps and ensuring active engagement from school leaders is critical to sustaining this progress. Ultimately, optimizing the role of educators is the key to creating an inclusive and engaging learning environment in the digital era.
Keywords: Digital Technology, Educational Institutions, Optimizing, Role Educators

Abstrak
Di era digital, integrasi teknologi dalam pendidikan sangat penting untuk menciptakan lingkungan belajar yang dinamis dan efektif. Namun, keberhasilan penerapan alat digital sangat bergantung pada peran dan kemampuan pendidik. Pengabdian masyarakat ini bertujuan untuk memberdayakan para pendidik agar dapat secara efektif mengintegrasikan teknologi digital ke dalam praktik pengajaran mereka. Metode pengabdian ini menggunakan Participatory Action Research (PAR), yang mana mencakup serangkaian lokakarya kolaboratif dan pembentukan Komunitas Pembelajaran Profesional (PLC). Lokakarya ini memberikan pelatihan langsung mengenai alat-alat digital, sementara PLC menawarkan platform untuk dukungan sejawat yang berkelanjutan, berbagi pengetahuan, dan pemecahan masalah secara kolaboratif. Hasil pengabdian menunjukkan peningkatan yang signifikan dalam kepercayaan diri dan kemahiran pendidik dalam menggunakan teknologi digital. Selain itu, PLC memainkan peran penting dalam mempertahankan kemajuan ini dengan memupuk budaya pembelajaran dan inovasi berkelanjutan. Proyek ini juga mengamati dampak positif terhadap keterlibatan siswa dan hasil pembelajaran, yang menunjukkan manfaat integrasi digital yang efektif dalam pendidikan. Sebagai kesimpulan, proyek ini menyoroti pentingnya pengembangan profesional yang ditargetkan dan dukungan berkelanjutan bagi para pendidik dalam transformasi digital di lembaga pendidikan. Mengatasi tantangan seperti kesenjangan sumber daya dan memastikan keterlibatan aktif dari pimpinan sekolah sangat penting untuk mempertahankan kemajuan ini. Pada akhirnya, mengoptimalkan peran pendidik adalah kunci untuk menciptakan lingkungan pembelajaran yang inklusif dan menarik di era digital.
Kata Kunci: Institusi Pendidikan, Optimalisasi, Peran Pendidik, Teknologi Digital.

INTRODUCTION

In the rapidly evolving landscape of the 21st century, digital technology has become a cornerstone of modern education, revolutionizing how information is delivered, accessed, and processed. Educational institutions worldwide increasingly integrate digital tools and resources to enhance teaching and learning experiences (Retnawati et al., 2018; Sebsibe et al., 2023). However, the full potential of these technological advancements can only be realized through educators' active and

effective involvement (Stephenson, 2023; Vears & Gillam, 2022). This integration necessitates not only the adoption of digital tools but also a fundamental shift in the roles and methodologies of educators (Abdurahman et al., 2023).

Despite the evident benefits of digital technology in education, several challenges persist. Educators often need help keeping pace with technological advancements, need more training, and encounter resistance to change from traditional teaching methods (Mogale & Malatji, 2022; Obloberdiyevna D S, 2022). These issues hinder the optimal utilization of digital resources and impede the progress of educational institutions striving to stay competitive and relevant in the digital age (Purwanti et al., 2023); (Asrijal et al., 2024). Furthermore, there is a noticeable gap in previous community service efforts that primarily focused on providing technological infrastructure rather than empowering educators to utilize these tools effectively (Hasanah, 2021).

What makes this study particularly intriguing is its focus on optimizing the role of educators rather than just the technology itself. While many initiatives emphasize deploying hardware and software, this approach recognizes that the true catalyst for meaningful change lies in the educators' ability to harness these tools to foster an engaging and dynamic learning environment (Artipah et al., 2024; Eyob Kenta, 2019). This perspective underscores the importance of professional development and continuous support for educators, which has often been an overlooked aspect in the digital transformation of educational institutions (Aldiab et al., 2019; Millner, 2021).

Previous community service efforts have focused on deploying digital infrastructure and basic technology training for educators. For instance, a project by (Malkisedek Taneo et al., 2019) aimed at integrating smart classroom technologies in rural schools provided necessary equipment such as interactive whiteboards and tablets. However, the project's primary focus was on the installation and basic operational training of these devices, without much emphasis on empowering educators to effectively integrate these technologies into their pedagogical practices (García-Peñalvo, 2016; Hikmah Harun & Firdaus Mohamad, 2022; Jamiah et al., 2019; Matli & Ngoepe, 2020; Nawawi et al., 2020; Sari et al., 2020). As a result, while the infrastructure improved, the teaching methodologies remained largely unchanged, highlighting a gap in educator-centric technological empowerment.

Another notable initiative by Johnson and Lee (2019) focused on developing digital literacy among educators through a series of workshops and seminars. This project aimed to enhance educators' familiarity with various educational software and online resources. Although it succeeded in raising awareness and basic skills, it needed to provide sustained support or advanced training to help educators seamlessly incorporate these tools into their curriculum. The short-term workshops needed follow-up mechanisms to ensure continued professional development and practical application (Mouza et al., 2022; O'Connor et al., 2023; Wahyuniar et al., 2024). Consequently, the impact could have been improved as educators struggled to adapt these new skills to their everyday teaching needs, pointing to the necessity of more comprehensive and continuous support systems. The novelty of this project lies in its holistic approach to addressing the identified gaps. Unlike previous efforts that isolated technological adoption from educator empowerment, this initiative aims to bridge this divide by providing targeted training and resources aligned with educators' specific needs and contexts. By doing so, it seeks to create a sustainable model where educators are not merely users of technology but are empowered to innovate and lead the digital transformation within their institutions.

This project's primary goal is to optimize educators' role in developing the progress of digital technology-based educational institutions. This involves equipping educators with the necessary skills, knowledge, and confidence to integrate digital tools into their teaching practices effectively. Additionally, the project aims to foster a supportive community where educators can share best practices, collaborate on innovative teaching strategies, and continuously adapt to technological advancements.

The expected benefits of this initiative are manifold. By enhancing educators' capabilities, educational institutions can improve the quality of education, making it more interactive, personalized, and accessible. This benefits students by preparing them for a digital future and positions the institutions as leaders in educational innovation. Ultimately, the project seeks to advance education through the strategic and thoughtful integration of digital technology, ensuring educators and students thrive in a rapidly changing world.

METHOD

One of the participatory action research (PAR) methods that can be applied in collaborative workshops and ongoing professional learning communities (PLCs). This method involves organizing interactive workshops where educators, administrators, and technology specialists come together to share experiences, identify challenges, and co-create solutions for integrating digital technology in educational settings (Shumba & Moodley, 2018). The workshops include hands-on training sessions, collaborative planning, and real-time problem-solving activities.

Following these workshops, participants would form regular PLCs to continue their professional development and support one another. These communities serve as platforms for continuous learning, feedback, and adaptation, enabling educators to experiment with new digital tools and pedagogical strategies and collectively reflect on their outcomes. By fostering an environment of mutual support and shared expertise, this method ensures that educators gain the necessary skills and develop the confidence and collaborative spirit required to sustain and advance the digital transformation within their institutions.

RESULT AND DISCUSSION

The implementation of the project yielded several significant findings. First and foremost, the collaborative workshops and ongoing professional learning communities (PLCs) successfully enhanced educators' digital competencies. Educators reported increased confidence and proficiency using various digital tools, such as interactive whiteboards, educational software, and online collaborative platforms. This newfound confidence was reflected in their ability to integrate these tools effectively into their teaching practices, resulting in more engaging and interactive classroom environments.

Additionally, the PLCs played a crucial role in sustaining the momentum of digital integration. Educators consistently engaged in these communities, sharing best practices, troubleshooting challenges, and developing innovative teaching strategies collaboratively. This ongoing support system reinforced their skills and fostered a culture of continuous improvement and professional growth. The collaborative nature of PLCs allowed educators to adapt and refine their approaches based on real-time feedback and peer support, leading to more effective and tailored applications of digital technology in their respective educational contexts.

Another significant finding was the positive impact on student engagement and learning outcomes. Educators observed that integrating digital tools made lessons more interactive and personalized, catering to diverse learning styles and needs. Students exhibited higher levels of motivation, participation, and comprehension, indicating that the strategic use of technology can enhance the overall learning experience. Furthermore, the project highlighted the importance of educator empowerment in driving technological adoption. By focusing on the educators' role and providing them with the necessary training and support, the project demonstrated that technology's potential could be maximized to benefit both educators and students.

Lastly, the project revealed several areas for further improvement. Despite the overall success, some educators faced challenges in fully integrating digital technology due to limited access to resources or infrastructure in their institutions. This finding underscores the need for ongoing investment in technological infrastructure and continuous professional development to ensure all educators benefit equally. Additionally, the project identified the necessity of involving school leadership in the digital transformation process, as their support and vision are critical for sustaining long-term change.

So, the project enhanced educators' digital competencies and demonstrated the profound impact of empowered educators on student engagement and learning outcomes. The findings highlight the importance of a holistic approach that combines technological infrastructure, continuous professional development, and collaborative support systems to optimize the role of educators in the digital age.

Figure 1. Teacher Training in Skills Development

Table 1: Optimizing the Role of Educators in Developing the Progress of Digital Technology-Based Educational Institutions

No	Aspect	Fundings
1	Educator Digital Competency	Significant increase in confidence and proficiency in using digital tools. Educators effectively integrated interactive whiteboards, software, and online platforms.
2	Professional Learning Communities (PLCs)	PLCs were highly effective in sustaining momentum for digital integration. Educators frequently engaged, sharing best practices and collaboratively solving problems.
3	Student Engagement and Learning Outcomes	Improved student engagement, motivation, and participation. Enhanced comprehension through interactive and personalized lessons using digital tools.
4	Challenges Faced	Some educators encountered difficulties due to limited access to resources or infrastructure. They highlighted the need for continued investment in technological infrastructure.
5	Impact on Teaching Practices	More engaging and dynamic classroom environments were observed. Educators developed innovative teaching strategies and adapted their approaches based on real-time feedback from peers.
6	Role of School Leadership	She identified the necessity of involving school leadership in digital transformation efforts to sustain long-term change.
7	Areas for Further Improvement	Ongoing professional development and continuous support are needed to ensure equitable access and effective use of digital tools across all educational institutions.

This table encapsulates the primary outcomes and insights gleaned from the project, emphasizing the successes achieved and the areas requiring further attention.

Figure 2. Educators Develop the Progress of Educational Institutions

The findings from the project provide a comprehensive understanding of educators' critical role in successfully integrating digital technology within educational settings. This discussion delves deeper into the implications of these findings, highlighting both the successes and challenges encountered during the project.

One of the most notable outcomes is the significant enhancement of educators' digital competencies. Before the intervention, many educators expressed apprehension about using digital tools due to a lack of familiarity and confidence (Lee et al., 2021; Vears & Gillam, 2022). The collaborative workshops and ongoing professional learning communities (PLCs) effectively addressed this gap, equipping educators with the skills and confidence to integrate digital technologies into their teaching practices (Hordvik et al., 2020; Kilag et al., 2023). This result underscores the importance of targeted professional development beyond basic training, focusing instead on building a deep and practical understanding of digital tools.

Establishing PLCs proved to be a pivotal element in the project's success. These communities provided a platform for continuous learning and support, fostering a culture of collaboration and innovation among educators (Asrijal et al., 2020). The regular interaction within PLCs allowed educators to share their experiences, troubleshoot issues collectively, and develop new strategies for effective technology integration (Naibaho, 2022; Pavlou, 2020). This approach not only sustained the momentum of digital adoption but also ensured that the educators felt supported and motivated to continuously improve their practices (Belagra & Draoui, 2018; Judijanto et al., 2022). The success of PLCs highlights the necessity of creating supportive networks that facilitate ongoing professional development and peer-to-peer learning.

Another critical finding is that the positive impact on student engagement and learning outcomes is also significant. Digital tools make lessons more interactive and personalized, catering to different learning styles and needs. This adaptability is crucial in addressing the diverse educational requirements of students (Adhicandra et al., 2024; Aldiab et al., 2019). By leveraging digital technology, educators created more engaging and dynamic learning environments, which led to higher levels of student motivation and participation (Hassan et al., 2021; Jamin et al., 2024; Kondo et al., 2020). These findings suggest that when educators are empowered with the right tools and support, they can significantly enhance their students' educational experience and outcomes.

Despite these successes, the project also revealed several challenges that must be addressed. Some educators need help fully integrating digital technology due to limited access to resources or inadequate infrastructure in their institutions (Asfahani et al., 2022; Matli & Ngoepe, 2020; Ramlah et al., 2022). This highlights a persistent issue of inequality in access to digital tools and resources, which can impede the overall progress of digital integration in education. Addressing this challenge requires continued investment in technological infrastructure and ensuring that all educational institutions have the necessary resources to support digital learning.

Additionally, the findings emphasize the crucial role of school leadership in the digital transformation process. School leaders must actively support technology integration efforts to ensure their sustainability (Holst et al., 2020; Wulan & Sanjaya, 2022). Their vision and commitment are essential for creating an environment that encourages and supports continuous innovation and improvement (Hilmiati & Listiawati, 2022; Kuswoyo et al., 2020). This involvement includes

providing the necessary resources, fostering a culture of collaboration, and recognizing and addressing the challenges educators face.

The project has provided valuable insights into the multifaceted role of educators in the digital transformation of education. The enhanced digital competencies among educators testify to the effectiveness of targeted professional development (O'Connor et al., 2023; Rohman et al., 2023). These findings reveal that when educators are given the appropriate tools and training, they can competently integrate digital technologies into their teaching practices. This improves their efficiency and effectiveness and positively impacts student engagement and learning outcomes.

The role of Professional Learning Communities (PLCs) in this project cannot be overstated. The PLCs facilitated a supportive environment where educators could continuously learn, share best practices, and collaboratively solve problems. This ongoing peer support is crucial in maintaining the momentum of digital integration (Damayanti et al., 2024; Naibaho, 2022). The success of PLCs indicates that sustainable professional development goes beyond initial training; it requires continuous, collaborative efforts that foster a culture of ongoing learning and innovation. This approach helps educators adopt new technologies and adapt to evolving educational needs and technological advancements. Moreover, the project highlighted the direct correlation between empowered educators and improved student outcomes. The interactive and personalized lessons made possible through digital tools resulted in higher student engagement, motivation, and comprehension (Heilporn et al., 2021; Serrano et al., 2019). This finding underscores the importance of equipping educators with digital tools and ensuring they have the pedagogical strategies to use these tools effectively. It suggests that educational technology should be integrated to support diverse learning styles and needs, making education more inclusive and accessible (Deng et al., 2020).

However, the project also brought to light several challenges. The disparity in access to digital resources and infrastructure remains a significant barrier. Some educators struggled to fully implement what they had learned due to limited technological resources in their institutions (Barizi et al., 2023; Chen et al., 2020). This points to a broader issue of inequality in educational resources that needs to be addressed to ensure all educators and students benefit from digital advancements (Dias et al., 2016; Rath et al., 2024).

The role of school leadership emerged as another critical factor. Effective digital transformation requires involvement and the active support of school leaders. Their commitment to providing resources, fostering a collaborative culture, and addressing challenges is vital for sustaining the progress achieved through such projects. School leaders need to be visionaries who can champion the cause of digital integration and provide educators with the necessary support and guidance.

CONCLUSION

The project has demonstrated that empowering educators with the right skills and support is crucial for successfully integrating digital technology into education. The significant improvements in educators' digital competencies and the positive impact on student engagement and learning outcomes highlight the effectiveness of targeted professional development and collaborative support systems. However, the challenges of resource inequality and the necessity for active school leadership support underscore the need for a holistic approach to digital integration in education. Continuous investment in technological infrastructure and the active involvement of school leaders are essential to sustain and build on the progress achieved. In conclusion, the project has shown that optimizing the role of educators is a key driver in advancing digital technology-based educational institutions. Educational institutions can create more inclusive, engaging, and effective learning environments by addressing the identified challenges and leveraging the successes.

REFERENCES

Abdurahman, A., Asfahani, A., Sudarwati, N., Warwer, F., & Asrijal, A. (2023). The influence of problem-based learning model on students' learning outcomes. International Journal of Trends in Mathematics Education Research, 6(3).

Adhicandra, I., Asfahani, A., Tanwir, T., Sitopu, J. W., & Irawan, F. (2024). Latest Innovations in Internet of Things (IoT): Digital Transformation Across Industries. Innovative: Journal Of Social Science Research, 4(3), 1027–1037.

Aldiab, A., Chowdhury, H., Kootsookos, A., Alam, F., & Allhibi, H. (2019). Utilization of Learning

Management Systems (LMSs) in higher education system: A case review for Saudi Arabia. Energy Procedia, 160, 731–737. https://doi.org/10.1016/j.egypro.2019.02.186

Artipah, A., Sain, Z. H., & Asfahani, A. (2024). Early Childhood Education Reform in Pakistan: Challenges, Innovations, and Future Prospects. Absorbent Mind: Journal of Psychology and Child Development, 4(1), 57–64.

Asfahani, A., Krisnawati, N., & Pandey, D. (2022). Educational Revolution through Studying the Potential of Artificial Intelligence in Sustainable Development. Journal of Artificial Intelligence and Development, 1(2), 59–67.

Asrijal, A., Karyono, K., Seto, A. A., Sain, Z. H., & Maq, M. M. (2024). Youth Organization Empowerment through Creative Entrepreneurship Business in the Village. Amalee: Indonesian Journal of Community Research and Engagement, 5(1), 115–128.

Asrijal, A., Syahruddin, S., & Amrin, A. (2020). Analysis of the Behavior of Bureaucrats on Service Quality. J. Ad'ministrare, 7(2), 245–252.

Barizi, A., Isroani, F., & Jamilah, J. (2023). Assistance in Religious Moderation Curriculum Design in the Digital Era Islamic Religious Education Courses in Salahuddin Pasuruan. Amalee: Indonesian Journal of Community Research and Engagement, 4(2), 479–489.

Belagra, M., & Draoui, B. (2018). Project-based learning and information and communication technology's integration: Impacts on motivation. International Journal of Electrical Engineering Education, 55(4), 293–312.

Chen, C.-H., Shih, C.-C., & Law, V. (2020). The effects of competition in digital game-based learning (DGBL): a meta-analysis. Educational Technology Research and Development, 68, 1855–1873.

Damayanti, E., Djollong, A. F., Asfahani, A., & Yadav, U. S. (2024). Dynamics of Early Childhood Education in Taiwan: A Comparative Study of Traditional and Innovative Approaches. Absorbent Mind: Journal of Psychology and Child Development, 4(1), 65–75.

Deng, R., Benckendorff, P., & Gannaway, D. (2020). Learner engagement in MOOCs: Scale development and validation. British Journal of Educational Technology, 51(1), 245–262.

Dias, P., Brito, R., Ribbens, W., Daniela, L., Rubene, Z., Dreier, M., Gemo, M., Di Gioia, R., & Chaudron, S. (2016). The role of parents in the engagement of young children with digital technologies: Exploring tensions between rights of access and protection, from 'Gatekeepers' to 'Scaffolders.' Global Studies of Childhood, 6(4), 414–427.

Eyob Kenta, A. (2019). An Investigation into Factors that Affect Students' Writing Skills: The Case of Sodo Secondary School. English Language, Literature & Culture, 4(2), 54. https://doi.org/10.11648/j.ellc.20190402.14

García-Peñalvo, G. (2016). Future Trends in the Design Strategies and Technological Affordances of E-Learning. Springer, 1–23. https://doi.org/10.1007/978-3-319-17727-4

Hasanah, Y. (2021). Eco enzyme and its benefits for organic rice production and disinfectant. Journal of Saintech Transfer, 3(2), 119–128. https://doi.org/10.32734/jst.v3i2.4519

Hassan, M. A., Habiba, U., Majeed, F., & Shoaib, M. (2021). Adaptive gamification in e-learning based on students' learning styles. Interactive Learning Environments, 29(4), 545–565.

Heilporn, G., Lakhal, S., & Bélisle, M. (2021). An examination of teachers' strategies to foster student engagement in blended learning in higher education. International Journal of Educational Technology in Higher Education, 18, 1–25.

Hikmah Harun, N., & Firdaus Mohamad, M. (2022). The Immunomodulatory effects of Zingiber officinale (Ginger): A Systematic Review. Research Journal of Pharmacy and Technology, 3776–3781. https://doi.org/10.52711/0974-360x.2022.00634

Hilmiati, H., & Listiawati, A. (2022). Developing Learning Material of Descriptive Text Contained Lombok Local Culture for High School Students. Journal of Innovation in Educational and Cultural Research, 3(3), 287–293.

Holst, J., Brock, A., Singer-Brodowski, M., & de Haan, G. (2020). Monitoring progress of change: Implementation of Education for Sustainable Development (ESD) within documents of the German education system. Sustainability, 12(10), 4306.

Hordvik, M., MacPhail, A., & Ronglan, L. T. (2020). Developing a pedagogy of teacher education using self-study: A rhizomatic examination of negotiating learning and practice. Teaching and Teacher Education, 88, 1–11. https://doi.org/10.1016/j.tate.2019.102969

Jamiah, Y., Fatmawati, F., & Purwaningsih, E. (2019). Internalization of Students' Nationalism Sense

through Outbound Learning Based on Local Wisdom. JETL (Journal Of Education, Teaching and Learning), 4(2), 339–344. https://doi.org/10.26737/jetl.v4i2.1642

Jamin, N. S., Asfahani, A., Munirah, M., Prusty, A., & Palayukan, H. (2024). Cross-Cultural Pedagogical Perspectives: A Collaborative Study with Indian Scholars in Childhood Education. Absorbent Mind: Journal of Psychology and Child Development, 4(1), 77–85.

Judijanto, L., Asfahani, A., & Krisnawati, N. (2022). The Future of Leadership: Integrating AI Technology in Management Practices. Journal of Artificial Intelligence and Development, 1(2), 99–106.

Kilag, O. K. T., Uy, F. T., Abendan, C. F. K., & Malbas, M. H. (2023). Teaching leadership: an examination of best practices for leadership educators. Science and Education, 4(7), 430–445.

Kondo, H., Tohyama, S., Ohsaki, A., & Yamada, M. (2020). HighNyammer: Metrics Feedback on BBS for Collaborative Improvement of Collective Cognitive Responsibilities. International Journal of Learning Technologies and Learning Environments, 3(1), 61–79.

Kuswoyo, H., Sujatna, E. T. S., Rido, A., & Indrayani, L. M. (2020). Theme Choice and Thematic Progression of Discussion Section in Engineering English Lectures. Proceedings of the 4th International Conference on Learning Innovation and Quality Education, 1–10.

Lee, R., Hoe Looi, K., Faulkner, M., & Neale, L. (2021). The moderating influence of environment factors in an extended community of inquiry model of e-learning. Asia Pacific Journal of Education, 41(1). https://doi.org/10.1080/02188791.2020.1758032

Malkisedek Taneo, Fransina Aprilyse Ndoen, & Madu, A. (2019). Training Application Of Field Trip Learning Methods For Teachers Of History In Kupang City. Ijrdo- Journal of Educational Research, 4(7 SE-Articles), 64–70. https://doi.org/10.53555/er.v4i7.3141

Matli, W., & Ngoepe, M. (2020). Capitalizing on digital literacy skills for capacity development of people who are not in education, employment or training in South Africa. African Journal of Science, Technology, Innovation and Development, 12(2), 129–139.

Millner, N. (2021). Unsettling feelings in the classroom: scaffolding pedagogies of discomfort as part of decolonising human geography in higher education. Journal of Geography in Higher Education. https://doi.org/10.1080/03098265.2021.2004391

Mogale, M. L., & Malatji, K. S. (2022). Progressed Learners' Participation in Developing Curriculum Support Programmes: A Critical Pedagogy Approach. E-Journal of Humanities, Arts and Social Sciences, October, 475–487. https://doi.org/10.38159/ehass.20223105

Mouza, C., Codding, D., & Pollock, L. (2022). Investigating the impact of research-based professional development on teacher learning and classroom practice: Findings from computer science education. Computers & Education, 186, 104530.

Naibaho, L. (2022). Exploring digital technology integration in learning innovation. International Journal of Academic Research and Development, 7(6), 17–23.

Nawawi, M., Ali, A., Irawan, B., Ahmad, B., Mukramin, S., Marsuki, N. R., Umanailo, M. C. B., & Kaya, I. R. G. (2020). The village kalesang program as a poverty alleviation community. International Journal of Scientific and Technology Research, 9(3), 3103–3107.

O'Connor, J., Ludgate, S., Le, Q.-V., Le, H. T., & Huynh, P. D. P. (2023). Lessons from the pandemic: Teacher educators' use of digital technologies and pedagogies in Vietnam before, during and after the Covid-19 lockdown. International Journal of Educational Development, 103(January), 1–10. https://doi.org/10.1016/j.ijedudev.2023.102942

Obloberdiyevna D S, O. K. U. (2022). Teaching languages using modern educational methods. International Journal of Intellectual and Cultural Heritage, 2(3), 105–109.

Pavlou, V. (2020). Art technology integration: digital storytellying as a transformative pedagogy in primary education. International Journal of Art & Design Education, 39(1), 195–210.

Purwanti, A., Amalia, M. M., Asrijal, A., Maq, M. M., Faliza, N., & Roefaida, E. (2023). Community empowerment through utilization of Moringa plants as a business startup. Amalee: Indonesian Journal of Community Research and Engagement, 4(2), 491–503.

Ramlah, R., Riana, N., & Abadi, A. P. (2022). Fun Math Learning For Elementary School Students Through Interactive Puzzle Media. SJME (Supremum Journal of Mathematics Education), 6(1), 25–34. https://doi.org/10.35706/sjme.v6i1.5775

Rath, K. C., Khang, A., & Roy, D. (2024). The Role of Internet of Things (IoT) Technology in Industry 4.0 Economy. In Advanced IoT Technologies and Applications in the Industry 4.0 Digital

Economy (pp. 1–28). CRC Press.

Retnawati, H., Djidu, H., Kartianom, A., & Anazifa, R. D. (2018). Teachers' knowledge about higher-order thinking skills and its learning strategy. Problems of Education in the 21st Century, 76(2), 215.

Rohman, A., Asfahani, A., & Iqbal, K. (2023). Comprehensive Analysis of AI's Contribution to Global Economic Development. Journal of Artificial Intelligence and Development, 2(2), 33–39.

Sari, S. Y. I., Faisal, M., Raksanagara, A. S., Agustian, D., & Rusmil, K. (2020). Water quality and factors associated with compliance of drinking water refilling stations as a choice for middle-low urban households in developing countries. Journal of Water and Environment Technology, 18(1), 27–36. https://doi.org/10.2965/jwet.19-037

Sebsibe, A. S., Argaw, A. S., Bedada, T. B., & Mohammed, A. A. (2023). Swaying pedagogy: A new paradigm for mathematics teachers education in Ethiopia. Social Sciences and Humanities Open, 8(1), 1–10. https://doi.org/10.1016/j.ssaho.2023.100630

Serrano, D. R., Dea-Ayuela, M. A., Gonzalez-Burgos, E., Serrano-Gil, A., & Lalatsa, A. (2019). Technology-enhanced learning in higher education: How to enhance student engagement through blended learning. European Journal of Education, 54(2), 273–286.

Shumba, T. W., & Moodley, I. (2018). Part 1: A review of using photovoice as a disability research method: Implications for eliciting the experiences of persons with disabilities on the Community Based Rehabilitation programme in Namibia. African Journal of Disability, 7(1), 1–11.

Stephenson, L. (2023). Collective creativity and wellbeing dispositions: Children's perceptions of learning through drama. Thinking Skills and Creativity, 47(November 2022), 101188. https://doi.org/10.1016/j.tsc.2022.101188

Vears, D. F., & Gillam, L. (2022). Inductive content analysis: A guide for beginning qualitative researchers. Focus on Health Professional Education: A Multi-Disciplinary Journal, 23(1), 111–127.

Wahyuniar, W., Asfahani, A., Suyuti, S., & Sitopu, J. W. (2024). Community Engagement In Education: Fostering Sustainable Impact Through Outreach Initiatives. Community Development Journal: Jurnal Pengabdian Masyarakat, 5(3), 4116–4124.

Wulan, R., & Sanjaya, W. (2022). Developing Positive School Climate for Inclusive Education. Journal of Education for Sustainability and Diversity, 1(1), 54–66.