Review of International Journal Education and School Leadership (RITEDUL)
Vol. 2 No. 2 May 2026, Page., 106-115
https://sagorvos.net/index.php/RITEDUL
e-ISSN: 3089-7491

THE TEACHING PROFESSION IN THE DIGITAL AGE: A LITERATURE REVIEW ON TEACHER COMPETENCIES, THE CHALLENGES OF TECHNOLOGICAL TRANSFORMATION, AND STRATEGIES FOR EDUCATORS' PROFESSIONAL DEVELOPMENT

Busnawir
Universitas Halu Oleo
busnawir@uho.ac.id

Mohammad Ahmad Bani Amer
Mutah University, Jordan

Abstract
The digital age has fundamentally transformed the paradigm of the teaching profession, demanding comprehensive transformation in teachers' competencies, the management of technological transformation challenges, and innovative professional development strategies. This literature review examines four core teacher competencies (pedagogical, professional, social, and personal) integrated with digital literacy through the TPACK and DigCompEdu frameworks, demonstrating that teachers in the digital age act as facilitators of adaptive learning and technology innovators. The analysis reveals key challenges including the digital divide, limited rural infrastructure, teacher resistance to adaptation, and administrative burdens that hinder the implementation of hybrid learning. Effective professional development strategies include practice-based ICT training, professional learning communities, microlearning platforms, and public-private collaboration for universal connectivity. Policy implications include flexible curriculum reform based on the 'Merdeka Belajar' initiative, equitable investment in digital infrastructure, and the strengthening of national digital literacy. These findings underscore the urgency of a holistic approach to cultivating competitive 21st-century educators, with recommendations for longitudinal empirical research to measure the effectiveness of AI and the metaverse in Indonesian education.
Keywords: digital teacher competencies, TPACK, educational technology transformation, professional development of educators, digital divide, teacher digital literacy, Merdeka Belajar

Introduction

The development of digital technology over the past few decades has brought significant changes to various sectors of life, including the field of education. This transformation has not only influenced how information is accessed and disseminated but has also shifted the learning paradigm from a conventional approach to one that is more flexible, interactive, and technology-based. In this context, the teaching profession faces increasingly complex demands for adaptation to meet the needs of learners in the digital era (Selwyn, 2021) .

The digital age is characterised by the emergence of various technological innovations such as artificial intelligence, online learning, and digital platforms that enable learning without the constraints of time and space. This situation encourages teachers to act not merely as conveyors of material, but also as facilitators capable of effectively managing various digital learning resources. These changes demand an enhancement of teachers' competencies so that they can adapt to the dynamics of modern education (Arnadi et al., 2021) .

Teachers' competencies are a key factor in determining the success of the learning process in the digital age. Teachers are required to possess pedagogical skills that are integrated with technology, so that they can create innovative and meaningful learning experiences. Furthermore, professional, social, and personal competencies must also be developed in a balanced manner to support the teacher's role as an agent of change in education (A. E. Putra et al., 2023) .

In a global context, various digital competence frameworks have been developed to help teachers improve the quality of learning. One widely used framework is Technological Pedagogical Content Knowledge (TPACK), which emphasises the importance of integrating technology, pedagogy, and content within the learning process. This framework serves as a key reference in the development of teachers' competencies in the digital age (Nafi'ah, 2021). In addition to TPACK, the Digital Competence of Educators (DigCompEdu) framework also provides comprehensive guidance on the digital competencies that educators must possess. This framework covers various aspects, ranging from the use of technology in learning to continuous professional development. The implementation of this framework is expected to improve the overall quality of education (Redecker, 2017) .

Nevertheless, digital transformation in education is not without its complex challenges. One of the main challenges is the digital divide that persists across various regions, particularly regarding access to technology and supporting infrastructure. This situation can hinder the equitable implementation of digital learning (Yajie et al., 2023) ; (Aslan, 2019a) . In addition to the digital divide, teachers' readiness to adopt technology also presents a significant challenge. Many teachers still face difficulties in integrating technology into their teaching, whether due to limited skills or a lack of adequate training. This highlights the importance of continuous professional development programmes for teachers (Zeichner, 2010) .

Resistance to change is also a barrier to digital education transformation. Some teachers tend to stick to traditional teaching methods because they find them more comfortable and familiar. Therefore, a strategic approach is needed to encourage a shift in mindset and boost teachers' motivation to adopt technological innovations (Wu et al., 2022) .

On the other hand, a heavy administrative burden often hinders teachers from developing their digital competencies. Time that should be spent on improving the

quality of learning is instead consumed by administrative tasks. This calls for policies that support teachers' work efficiency so that they can focus on professional development (Astuti et al., 2023). To address these various challenges, effective and sustainable professional development strategies are required. Technology-based training, professional learning communities, and the use of digital platforms offer alternatives that can significantly enhance teachers' competencies. These strategies must be designed systematically and tailored to teachers' needs (Aslan & Shiong, 2023). Furthermore, collaboration among teachers through professional learning communities (Professional Learning Communities) can serve as an effective means of sharing experiences and best practices. Through this collaboration, teachers can support one another in addressing the challenges of learning in the digital age and collectively improve the quality of learning (Yajie et al., 2023) ; (Busnawir & Aslan, 2026).

Consequently, the teaching profession in the digital age demands a comprehensive transformation, both in terms of competencies and professional development strategies. This literature review aims to examine in depth teachers' competencies, the challenges of technological transformation, and professional development strategies for educators as an effort to improve the quality of education in the digital age.

Results and Discussion

Teacher Competencies in the Digital Age

The digital age has fundamentally transformed the paradigm of education, requiring teachers to possess competencies that extend beyond traditional pedagogical aspects to include the ability to adapt to information and communication technologies. Teachers' competencies in this era must encompass a deep mastery of learning materials alongside the ability to utilise digital technology to create innovative learning experiences relevant to the needs of Generation Z and Alpha students. This transformation positions teachers as lifelong learners capable of integrating various digital tools into the teaching process (G. Widjaja & Aslan, 2022); (Widiastuti et al., 2018).

Teachers' pedagogical competence in the digital age emphasises the ability to design learning that effectively integrates technology. Teachers must be able to adapt learning experiences by utilising platforms such as Google Classroom, Zoom, or Kahoot to encourage creativity and active student participation. This approach enables the development of self-regulated learning, where students can manage their own learning processes through digital tools (Jamilah et al., 2025) ; (Aslan Aslan & Pong, 2026) . One of the key frameworks defining digital teacher competence is Technological Pedagogical Content Knowledge (TPACK), which integrates technological knowledge, pedagogy, and subject content. This framework requires teachers to understand how technology can enrich teaching without compromising pedagogical essentials, thereby making learning more contextual and meaningful for students (Judijanto, 2024) .

The professional competencies of 21st-century teachers include high digital literacy, whereby teachers must be proficient in technological systems and able to transfer knowledge to new situations. This encompasses collaboration with students and colleagues using digital tools to support learning innovation, such as the collaborative platforms Padlet or Microsoft Teams. Digital-savvy teachers serve as models for how to learn and work in the information age (Cahyono & Aslan, 2025) .

Digital literacy has a significant positive influence on teachers' pedagogical competence, with a low but meaningful correlation ($r = 0.261$, $p < 0.01$). The higher a teacher's digital literacy, the better their pedagogical ability to design interactive learning. This study confirms that improving digital literacy is key to strengthening the competencies of primary school teachers in the era of transformation (A. E. Putra et al., 2023) .

Teachers' digital competence is defined as the ability to utilise technology in the teaching and learning process in line with pedagogical competence. Ukrainian researchers Blyznyuk and Tetyana identified five main criteria, including mastery of social media, the internet for learning materials, and the creation of engaging digital media. These competencies are essential for addressing the characteristics of digital native students (Tuhuteru et al., 2023) .

Teachers in the digital age must master four core competencies: pedagogical, personal, professional, and social, with an emphasis on technology integration. Law No. 14 of 2005 on Teachers and Lecturers serves as the foundation, wherein professional competencies encompass the utilisation of ICT to address the challenges of the modern era. Upgrading these competencies is essential to remain relevant to students' needs (Epstein, 2018) .

Strengthening the pedagogical competencies of primary school teachers through a systematic literature review highlights the need to adapt to technological developments. Teachers must be both theoretically and practically proficient in using ICT, employing training strategies based on literature analysis. Digital transformation demands that teachers become adaptive facilitators of learning (Anderson & Dron, 2011). 21st-century teacher competencies encompass critical thinking, technology, and literacy skills, in addition to pedagogical, social, and cultural competencies. Teachers must design lesson plans that utilise ICT, engage in reflection through Classroom Action Research, and optimise teaching skills for the millennial and digital generations. This development is crucial for quality education in Indonesia (Nindigraha et al., 2026) .

Technological literacy is an essential foundational skill for modern teachers, extending beyond mere device usage to an understanding of educational applications. Teachers must utilise online platforms for interactive learning, making the teaching process more enjoyable and effective for students. This skill supports the overall effectiveness of teaching and learning (Aslan, 2017) . Previous studies have found a positive correlation between digital competence and the professionalism of 21st-

century teachers. Dimensions include technology-based planning, digital pedagogical innovation, digital-assisted assessment, and professional development via online platforms. Recommendations include practical training and the integration of ICT into teacher education (P. Putra et al., 2020) .

A professional teacher in the digital age is one who carries out technology-based tasks whilst maintaining four core competencies. Digital support is required for pedagogical, personal, social, and professional aspects, ensuring effective learning for digital students. These competencies provide a solution to the challenges of the information age (Kim et al., 2015) . In practice, digital teacher competencies include the use of the internet and social media for efficient learning. Teachers must master technology-based methods, techniques, and media to keep pace with the digital generation of students, making learning more engaging and results-oriented. Descriptive qualitative research underscores this urgency (Kim et al., 2015) .

Overall, teachers' competencies in the digital age shape them as agents of educational transformation who are innovative, adaptive, and student-centred. The integration of technology with holistic competencies ensures quality education that is relevant to the demands of the 21st century and ready to face the digital future.

Challenges of Technological Transformation and Strategies for Educator Professional Development

Technological transformation in education faces significant infrastructure challenges, with 65% of respondents identifying unstable internet connectivity as the main barrier. Limited access to the internet and devices in remote areas hinders the implementation of technology-based learning, particularly in Indonesia, which has significant urban-rural disparities. These challenges require massive investment to bridge the digital divide so that transformation can be equitable (Yablonsky, 2018) .

Teacher training is a crucial issue, with 72% of teachers requiring further development to utilise technology effectively. A lack of digital skills leads to resistance to adoption, with teachers struggling to integrate tools such as LMS or AI into their daily teaching. A strategy of continuous training is needed to address this lack of readiness (Wahyudi et al., 2025) . Data security and privacy present ethical challenges in digital transformation, with risks of student information breaches via online platforms. Teachers often express concerns about personal data leaks, which hinder the use of cloud-based learning. National data protection policies must be strengthened to build trust (Lin et al., 2024) .

The digital age demands that educators possess digital competencies, adaptive pedagogical skills, and a lifelong learning mindset to navigate rapid change. The primary challenge is rapid adaptation to new technologies, whilst professional development strategies include intensive training and cross-sector collaboration. Government policy support is essential for navigating the digital landscape (P. Putra et al., 2024) . The

technological infrastructure gap in rural areas is a major barrier to the digital transformation of education in Indonesia. Limited internet access and a shortage of devices make hybrid learning difficult to implement, widening the disparity in educational quality between regions. National strategies must prioritise universal connectivity (Sudarmo et al., 2021) . School budget constraints hinder the procurement of hardware such as computers and educational software, as well as the costs of teacher training. State schools in rural areas often struggle with funding allocation, causing digital transformation to stall. Public-private collaboration is required for technology subsidies (Aslan & Setiawan, 2019) .

A rigid, conventionally oriented curriculum is difficult to integrate with digital learning, which demands student autonomy. Teachers are constrained by one-way teaching methods, hindering technological innovation. Flexible curriculum reform is a key strategy for adaptation (Aslan, 2019b) ; (Aslan & Wahyudin, 2020) .

Key strategies for teacher professional development in the digital age include ICT training, collaboration among teachers, and participation in professional discussions. School-government support through digital literacy and effective development models can enhance holistic professionalism. The integration of technology into educational practice is a priority (Aslan et al., 2020) . Collaborative, practice-based training is more effective in building teachers' digital competencies than one-way theoretical instruction. This model fosters a sense of ownership and active engagement, improving the quality of students' learning processes through digitalisation. The implementation of professional learning communities is recommended (Nayor, 2016) .

The digitisation of learning has a positive impact on student motivation, whilst teacher competence mediates variations in teaching methods. Development strategies must focus on enhancing competence to optimise digitisation (Yaqin et al., 2023) . Digital transformation has a significant impact on teachers' pedagogical, social, professional, and personal competencies. The challenges of adapting technology-based methods are addressed through digital literacy and continuous training to ensure learning effectiveness (Yang, 2025) .

Information technology training, teacher collaboration, and institutional support form a holistic strategy for digital professionalism. This approach combines technical, pedagogical, and spiritual aspects for adaptation to the digital age (Bond et al., 2018) . The digital divide, low technological literacy, and privacy management present challenges to the integration of educational technology. Comprehensive strategies encompass infrastructure planning, teacher training, and risk policies to optimise benefits (M. P. & A. Widjaja, 2021).

Overall, professional development strategies must be holistic, integrating training, collaboration, and policy support to address the challenges of transformation.

Adaptive educators will ensure that Indonesian education remains competitive in the digital age.

Conclusion

The teaching profession in the digital age demands a comprehensive transformation of teachers' competencies, integrating pedagogical, professional, social, and personal skills with high digital literacy. The TPACK and DigCompEdu frameworks serve as the primary foundations for shaping teachers as innovative facilitators capable of utilising technology for meaningful learning, whilst challenges such as the digital divide, resistance to adaptation, and infrastructure limitations require a systematic approach. Professional development strategies through practice-based training, professional learning communities, and institutional policy support have proven effective in overcoming barriers to technological transformation.

The practical implications of this review underscore the need for national education policy reform that prioritises equitable investment in digital infrastructure, continuous training programmes for teachers, and the integration of flexible, technology-based curricula. Strengthening public-private collaboration in providing online learning platforms and microlearning can accelerate teachers' adaptation to the dynamics of the digital age, thereby enhancing the overall quality of education. This holistic approach will make the teaching profession more adaptive and competitive in facing the challenges of the 21st century.

As a recommendation for further research, longitudinal empirical studies are needed to measure the effectiveness of professional development strategies within the Indonesian context, particularly regarding the implementation of Merdeka Belajar and digital transformation. In-depth research on the impact of AI and the metaverse on teachers' competencies is also a key priority for preparing for the future of education. Thus, the teaching profession can evolve into a key pillar in fostering high-calibre human resources in the digital age.

References

Anderson, T., & Dron, J. (2011). Three Generations of Distance Education Pedagogy. *International Review of Research in Open and Distributed Learning*, *12*(3), 80–97. https://doi.org/10.19173/irrodl.v12i3.890

Arnadi, A., Aslan, A., & Mahbu, M. (2021). UPAYA GURU PENDIDIKAN AGAMA ISLAM DALAM MENGIMPLEMENTASIKAN KURIKULUM 2013 MADRASAH IBTIDAIYAH SE-KKM 2 SAMBAS. *Inspiratif Pendidikan*, *10*(2), 247–256. https://doi.org/10.24252/ip.v10i2.18571

Aslan. (2017). Pumping Teacher dalam Tantangan Pendidikan Abad 21. *Muallimuna*, *2*(2), 89–100. https://doi.org/10.31602/muallimuna.v2i2.771

Aslan. (2019a, January 17). *Pergeseran Nilai Di Masyarakat Perbatasan (Studi tentang Pendidikan dan Perubahan Sosial di Desa Temajuk Kalimantan Barat)* [Disertasi dipublikasikan]. https://idr.uin-antasari.ac.id/10997/

Aslan, A. (2019b). *HIDDEN CURRICULUM*. Pena Indis.

Aslan, A., & Setiawan, A. (2019). InternalIzatIon of Value educatIon In temajuk-melano malaysIa Boundary school. *Edukasia: Jurnal Penelitian Pendidikan Islam*, *14*(2).

Aslan, A., & Shiong, P. K. (2023). Learning in the Digital Age Full of Hedonistic Cultural Values Among Elementary School Students. *Bulletin of Pedagogical Research*, *3*(2), 94–102. https://doi.org/10.51278/bpr.v3i2.515

Aslan, A., Silvia, S., Nugroho, B. S., Ramli, M., & Rusiadi, R. (2020). TEACHER'S LEADERSHIP TEACHING STRATEGY SUPPORTING STUDENT LEARNING DURING THE COVID-19 DISRUPTION. *Nidhomul Haq : Jurnal Manajemen Pendidikan Islam*, *5*(3), 321–333. https://doi.org/10.31538/ndh.v5i3.984

Aslan Aslan, & Pong, K. S. (2026). Principals' Leadership Styles and Teachers' Commitment: The Mediating Role of Job Satisfaction - Aslan Aslan, Kok Shiong Pong, 2026. *Journal of School Leadership*. https://journals.sagepub.com/doi/10.1177/10526846261438721

Aslan & Wahyudin. (2020). *Kurikulum dalam Tantangan Perubahan*. Bookies Indonesia. https://scholar.google.com/scholar?oi=bibs&hl=en&cluster=17745790780728460138

Astuti, S. E. P., Aslan, A., & Parni, P. (2023). OPTIMALISASI PERAN GURU DALAM PROSES PEMBELAJARAN KURIKULUM 2013 DI MADRASAH IBTIDAIYAH SWASTA. *SITTAH: Journal of Primary Education*, *4*(1), 83–94. https://doi.org/10.30762/sittah.v4i1.963

Bond, M., Marín, V. I., Dolch, C., Bedenlier, S., & Zawacki-Richter, O. (2018). Digital transformation in German higher education: Student and teacher perceptions and usage of digital media. *International Journal of Educational Technology in Higher Education*, *15*(1), 48. https://doi.org/10.1186/s41239-018-0130-1

Busnawir, & Aslan, A. (2026). THE APPLICATION OF PROJECT-BASED LEARNING TO ENHANCE CREATIVITY AND COLLABORATIVE SKILLS AMONG PRIMARY SCHOOL PUPILS IN THE ERA OF THE MERDEKA CURRICULUM. *Indonesian Journal of Education (INJOE)*, *5*(2), 364–378.

Cahyono, D., & Aslan, A. (2025). THE ROLE AND CHALLENGES OF HONORARY TEACHERS IN THE NATIONAL EDUCATION SYSTEM: A LITERATURE REVIEW. *INTERNATIONAL JOURNAL OF SOCIETY REVIEWS*, *3*(5), Article 5.

Epstein, J. (2018). *School, Family, and Community Partnerships, Student Economy Edition: Preparing Educators and Improving Schools* (2nd ed.). Routledge. https://doi.org/10.4324/9780429493133

Jamilah, W. S. N., Halimah, L., & Puspita, N. T. (2025). Pemanfaatan Artificial Intelligence terhadap Kompetensi Pedagogik Guru. *IQRO: Journal of Islamic Education*, *8*(1), 388–404. https://doi.org/10.24256/iqro.v8i1.6857

Judijanto, L. (2024). Analisis Pengaruh Tingkat Literasi Digital Guru dan Siswa terhadap Kualitas Pembelajaran di Era Digital di Indonesia. *Sanskara Pendidikan Dan Pengajaran*, *2*(02), 50–60. https://doi.org/10.58812/spp.v2i02.391

Kim, C., Kim, D., Yuan, J., Hill, R. B., Doshi, P., & Thai, C. N. (2015). Robotics to promote elementary education pre-service teachers' STEM engagement, learning, and teaching. *Computers & Education*, *91*, 14–31. https://doi.org/10.1016/j.compedu.2015.08.005

Lin, I.-C., Yeh, I.-L., Chang, C.-C., Liu, J.-C., & Chang, C.-C. (2024). Designing a Secure and Scalable Data Sharing Mechanism Using Decentralized Identifiers (DID). *Computer Modeling in Engineering & Sciences*, *141*(1), 809–822. https://doi.org/10.32604/cmes.2024.051612

Nafi'ah, J. (2021). Adaptasi Pembelajaran E-Learning dan Blended Learning di Era New Normal pada Peserta Didik Madrasah Ibtidaiyah. *Auladuna: Jurnal Prodi Pendidikan Guru Madrasah Ibtidaiyah*, *3*(1), 23–36. https://doi.org/10.36835/au.v3i1.476

Nayor, G. K. K. (2016). *Teacher-Parent Collaboration in Two Primary Schools' Special Education Integrated Programmes: Application of Epstein's Framework*. University of Malaya (Malaysia). https://search.proquest.com/openview/5148f1cba7f4e49c3a9936d833b0620d/1?pq-origsite=gscholar&cbl=2026366&diss=y

Nindigraha, N., Firdaus, K. H. C., Prihatmoko, Y., & Oktaviani, H. I. (2026). Assessing Teacher Readiness for AI Utilization: Between Innovation Opportunities and Ethical Challenges in 21st-Century Learning. *Jurnal Teknologi Pendidikan : Jurnal Penelitian Dan Pengembangan Pembelajaran*, *11*(1), 185–202. https://doi.org/10.33394/jtp.v11i1.18047

Putra, A. E., Rohman, M. T., Linawati, L., & Hidayat, N. (2023). Pengaruh literasi digital terhadap kompetensi pedagogik guru. *Murhum: Jurnal Pendidikan Anak Usia Dini*, *4*(1), 201–211.

Putra, P., Asike, A., Syahril, M. A. F., & Andirwan, A. (2024). Sinergi Manajemen Pemasaran, SDM, dan Kepatuhan Hukum ITE: Strategi Terpadu dalam Pengelolaan Perguruan Tinggi di Era Digital. *Jurnal Ilmiah Manajemen & Kewirausahaan*, *10*(3), 189–194.

Putra, P., Setianto, A. Y., Hafiz, A., Mutmainnah, & Aslan. (2020). ETNOPEDAGOGIC STUDIES IN CHARACTER EDUCATION IN THE MILLINNEAL ERA: CASE STUDY MIN 1 SAMBAS. *Al-Bidayah : Jurnal Pendidikan Dasar Islam*, *12*(2), 237–252. https://doi.org/10.14421/al-bidayah.v12i2.547

Redecker, C. (2017). *European framework for the digital competence of educators: DigCompEdu*. https://publications.jrc.ec.europa.eu/repository/bitstream/JRC107466/pdf_digcomedu_a4_final.pdf

Selwyn, N. (2021). *Education and Technology: Key Issues and Debates*. Bloomsbury Publishing.

Sudarmo, S., Arifin, A., Pattiasina, P. J., Wirawan, V., & Aslan, A. (2021). The future of instruction media in Indonesian education: Systematic review. *Al-Ishlah: Jurnal Pendidikan*, *13*(2), 1302–1311.

Tuhuteru, L., Misnawati, D., Aslan, A., Taufiqoh, Z., & Imelda, I. (2023). The Effectiveness of Multimedia-Based Learning To Accelerate Learning After The Pandemic At The

Basic Education Level. *Tafkir: Interdisciplinary Journal of Islamic Education*, *4*(1), 128–141. https://doi.org/10.31538/tijie.v4i1.311

Wahyudi, E., W, N. M. R., & Nanda, N. (2025). Strategi Peningkatan Literasi Digital Guru Dalam Menghadapi Transformasi Pendidikan 4.0. *Satya Sastraharing : Jurnal Manajemen*, *9*(1), 175–189. https://doi.org/10.33363/satya-sastraharing.v9i1.1470

Widiastuti, A., Istihapsari, V., Afriady, D., Lhi Banguntapan, S., & Wirobrajan, S. M. (2018). Meningkatkan Kreativitas Siswa Melalui Project Based Learning pada Siswa Kelas V SDIT LHI. *Prosiding Pendidikan Profesi Guru Fakultas Keguruan Dan Ilmu Pendidikan*, 1430–1440.

Widjaja, G., & Aslan, A. (2022). Blended Learning Method in The View of Learning and Teaching Strategy in Geography Study Programs in Higher Education. *Nazhruna: Jurnal Pendidikan Islam*, *5*(1), 22–36. https://doi.org/10.31538/nzh.v5i1.1852

Widjaja, M. P. & A. (2021). *Strategi dan Transformasi Digital*. Kepustakaan Populer Gramedia.

Wu, X., Xiao, L., Sun, Y., Zhang, J., Ma, T., & He, L. (2022). A survey of human-in-the-loop for machine learning. *Future Generation Computer Systems*, *135*, 364–381. https://doi.org/10.1016/j.future.2022.05.014

Yablonsky, S. (2018). A Multidimensional Framework for Digital Platform Innovation and Management: From Business to Technological Platforms. *Systems Research and Behavioral Science*, *35*(4), 485–501. https://doi.org/10.1002/sres.2544

Yajie, L., Liu, H., & Gaoming, M. (2023). Widening Digital Divide: Family Investment, Digital Learning, and Educational Performance of Chinese High School Students During the COVID-19 Pandemic School Closures. *Applied Research in Quality of Life*, *18*(5), 2397–2413. https://doi.org/10.1007/s11482-023-10191-y

Yang, Q. (2025). Principles for the Standardized Handling of Digital Property Inheritance. *Humanities and Social Science Research*, *8*(3), p29–p29. https://doi.org/10.30560/hssr.v8n3p29

Yaqin, L. N., Prasojo, L. D., Haji-Othman, N. A., Yusof, N., & Habibi, A. (2023). Addressing the Digital Divide in Indonesian Higher Education: Insights, Implications, and Potential Solutions. In Ł. Tomczyk, F. D. Guillén-Gámez, J. Ruiz-Palmero, & A. Habibi (Eds.), *From Digital Divide to Digital Inclusion: Challenges, Perspectives and Trends in the Development of Digital Competences* (pp. 291–307). Springer Nature. https://doi.org/10.1007/978-981-99-7645-4_13

Zeichner, K. (2010). Rethinking the Connections Between Campus Courses and Field Experiences in College- and University-Based Teacher Education. *Journal of Teacher Education*, *61*(1–2), 89–99. https://doi.org/10.1177/0022487109347671