IJBMC
International Journal of Body, Mind and Culture

Volume 13, Issue 11, Article e2026-1410
DOI: 10.61838/ijbmc.v13i11.1410

Article type:
Qualitative Research

Digital Literacy Barriers and Improvement Strategies Among University Teachers in Qinghai Province, China: A Qualitative Interview Study

Ke. Zhang[1], Huan. Cao[1], Ying. Jin[1*], Bo. Wang[1], Xichang. Huang[1]

1 Dhurakij Pundit University, 110/1-4 Prachachuen Road, Laksi, Bangkok 10210, Thailand.

Corresponding author email address:
jin.yin@dpu.ac.th



Article history:

Received 19 Jul 2026
Revised 22 Aug 2026
Accepted 16 Sep 2026
Published online 01 Nov 2026

How to cite this article:
Zhang, K., Cao, H., Jin, Y., Wang, B., & Huang, X. (2026). Digital Literacy Barriers and Improvement Strategies Among University Teachers in Qinghai Province, China: A Qualitative Interview Study. International Journal of Body, Mind and Culture, 13(11), Article e2026-1410. https://doi.org/10.61838/ijbmc.v13i11.1410

© 2026 the authors. This is an open access article under the terms of the Creative Commons Attribution-NonCommercial 4.0 International (CC BY-NC 4.0) License.

ABSTRACT

Objective: This study explored perceived barriers to digital literacy development and proposed improvement strategies among university faculty and administrators in Qinghai Province, China.

Methods and Materials: A qualitative interview study was conducted across four purposively selected universities. Twenty participants, including four administrators and 16 teachers, were recruited through purposive sampling. Data were collected in March–April 2022 through four individual interviews with administrators and four focus groups involving teachers. Interviews were conducted remotely in Chinese, audio-recorded, transcribed verbatim, and analyzed using Braun and Clarke's six-phase thematic analysis. Credibility was supported through transcript checking, comparison of participant perspectives, and an audit trail.

Findings: Four interconnected barriers emerged: inadequate institutional mechanisms, limited institutional prioritization, psychological resistance to technological change, and insufficient integration of digital tools into teaching. Participants described fragmented training, unclear development pathways, technological anxiety, insufficient technical assistance, and difficulty adapting digital resources to disciplinary instruction. Three improvement approaches were proposed: strengthened policy and incentive arrangements, diversified professional learning, and motivational support. Participants emphasized sustained practical training, discipline-sensitive workshops, peer learning, accessible expert guidance, and institutional encouragement.

Conclusion: Digital literacy development was perceived as involving institutional, psychological, and pedagogical challenges. Coordinated professional development and sustained technical support may address participants' reported needs; however, the proposed strategies require empirical evaluation.

Keywords: Digital Literacy, Higher Education, Institutional Barriers, Professional Development, Qualitative Research.

Introduction

Digital transformation requires university teachers to combine operational skills with critical judgment, pedagogical design, and continuing professional learning. Digital literacy is therefore understood here as the capacity to use, evaluate, and integrate digital technologies in teaching and professional practice. This broader understanding is consistent with educator competence frameworks that connect digital resources, teaching, assessment, professional engagement, and learner support (Redecker, 2017). Possessing equipment or knowing basic office software does not, by itself, demonstrate competence in designing technology-supported learning.

Research in higher education has identified barriers related to teachers' beliefs, instructional practices, and institutional support. A Chilean study of technology-supported assessment examined the role of teachers' conceptions of learning and evaluation, while research with accounting faculty documented resistance to new educational technologies (Romero Alonso et al., 2019; Watty et al., 2016). Technology adoption also involves differences in teachers' prior experience and patterns of use (Aldunate & Nussbaum, 2013). These studies inform the present inquiry without establishing the prevalence or causes of barriers in Qinghai.

Evidence from other educational settings similarly suggests that digital competence develops within an organizational environment. A review of schools' digital transformation identified interacting institutional and individual conditions, and a review of Chinese K–12 teachers distinguished issues affecting pre-service and in-service digital competence (Timotheou et al., 2023; L. Yang et al., 2023). Because these populations differ from university faculty, their findings provide comparative context rather than direct evidence about Qinghai's universities. Research on teacher digital literacy also emphasizes the need to move beyond basic technical familiarity toward meaningful educational use (Sánchez-Cruzado et al., 2021).

Qinghai Province provides a context for examining how teachers and administrators experience digital literacy development in western China. The present study focuses on participants' accounts of access to professional learning, institutional arrangements, technical assistance, and classroom integration. Rather than assuming that all institutions or teachers face the same conditions, it explores how these issues are described across four universities. It addresses two questions: What barriers do participants identify in developing university teachers' digital literacy? What improvement approaches do they propose?

Methods and Materials

Study Design and Setting

A qualitative interview design explored experiences of digital literacy development at four universities in Qinghai Province, China. Semi-structured individual interviews were conducted with administrators, and focus group interviews were conducted with frontline teachers. The design sought contextual accounts of perceived barriers and proposed improvements rather than statistical estimates of digital competence or intervention effectiveness.

Sampling and Participants

Universities were purposively selected to reflect variation in disciplinary orientation, institutional size, and levels of digital teaching support. One administrator and four teachers were recruited from each university, yielding 20 participants: four administrators and 16 teachers. Administrators were responsible for faculty development, teaching management, or digitalization policies and had more than ten years of relevant professional experience. Teachers had at least five years of teaching experience. The sampling strategy sought professional experience and variation in institutional perspective; it did not provide a representative sample of all university teachers in Qinghai.

Administrators' positions, qualifications, years of service, and institutional codes are presented in Table 1. Corresponding teacher characteristics are presented in Table

2. Universities are designated A–D to protect institutional identities.

Table 1

Administrator characteristics

Code	Position	Years of Service	Degree	University
IG1	Dean	22	Ph.D.	A
IG2	Director	17	Ph.D.	B
IG3	Dean	18	Ph.D.	C
IG4	Director	14	Ph.D.	D

Note. n = 4. Universities are anonymized as A–D. Years of service are as reported.

Table 2

Teacher characteristics

Code	Position	Years of Service	Degree	University
TG1	Teacher	7	Master	A
TG2	Teacher	8	Master	A
TG3	Teacher	5	Master	A
TG4	Teacher	7	Master	A
TG5	Teacher	6	Master	B
TG6	Teacher	10	Master	B
TG7	Teacher	12	Master	B
TG8	Teacher	9	Master	B
TG9	Teacher	6	Master	C
TG10	Teacher	8	Master	C
TG11	Teacher	8	Master	C
TG12	Teacher	9	Master	C
TG13	Teacher	6	Master	D
TG14	Teacher	7	Master	D
TG15	Teacher	12	Master	D
TG16	Teacher	10	Master	D

Note. n = 16. Four teachers were recruited from each university. Universities are anonymized as A–D.

Interview Guide and Data Collection

The semi-structured guide contained demographic questions and four open-ended questions addressing digital literacy development, professional learning, difficulties in using educational technologies, and suggested improvements (Table 3). Five external higher education experts reviewed the guide for clarity and content relevance before data collection. Their feedback informed the wording and structure of the questions. They served as protocol reviewers and were not members of the formal interview sample.

Ijbmc.org
E-ISSN: 2345-5802

Table 3

Semi-structured interview guide

Question	Item
Q1	In your teaching field, how has your digital literacy (e.g., the ability to use information technology or educational software) been developed and improved over time?
Q2	In your own professional learning, what approaches do you usually adopt to enhance your digital literacy (e.g., using multimedia tools, searching for instructional resources)?
Q3	What are the main difficulties you encounter when using computers or educational technologies (e.g., reluctance to use them, operational complexity)? What suggestions or strategies do you propose to overcome these challenges?
Q4	What major obstacles do you face in improving your digital literacy for teaching (e.g., integrating digital tools into your discipline instruction)? What effective strategies could be used to address these issues?

Note. The guide was reviewed by five external higher education experts before data collection.

Data were collected in March and April 2022 through Tencent Video. Four individual interviews and four focus group interviews were conducted; each focus group comprised four teachers. Individual interviews and focus group sessions each lasted approximately 1.5 hours. Interviews were conducted in Chinese, audio-recorded, and supported by contemporaneous notes. Recordings were transcribed in Chinese, and participants checked their transcripts for accuracy. Anonymized excerpts were translated into English for reporting and checked against the original Chinese transcripts to preserve their meaning.

Data Analysis and Trustworthiness

Thematic analysis followed the six-phase approach of familiarization, initial coding, theme development, theme review, theme definition and naming, and reporting (Braun & Clarke, 2006). Transcripts were read repeatedly. Initial codes captured accounts of digital knowledge, technology use, institutional support, professional learning, and perceived difficulties. Related codes were grouped into categories, and candidate themes were reviewed for coherence across the dataset. Representative excerpts were selected to illustrate the themes. Coding was developed from the interview material rather than imposed from a predetermined competence framework.

Trustworthiness was considered through credibility, transferability, dependability, and confirmability (Lincoln & Guba, 1985). Transcript checking supported the accuracy of the recorded accounts. Administrators' and teachers' perspectives were compared, and analytic interpretations were checked against the coded material. Such comparison can strengthen interpretation while preserving differences between accounts (Carter et al., 2014). The research record included procedural logs, contextual notes, and coding definitions to support an audit trail. Context and participant characteristics are reported to help readers judge transferability.

Ethical Considerations

The study was reviewed and approved by the Institutional Review Board of Dhurakij Pundit University, Thailand, where the researcher was enrolled during the study period. All participants were adult university teachers or administrators. Participation was voluntary, and informed consent was obtained before data collection. Participants were informed of the study's purpose, procedures, confidentiality protections, and right to withdraw without penalty. Transcripts and reported excerpts were anonymized to protect participants' identities.

Findings and Results

The interviews described barriers and possible improvements in acquiring digital knowledge, applying skills, mastering unfamiliar tools, and integrating technology into teaching. Administrators' and teachers' accounts are presented separately before the cross-cutting themes are summarized. Quotation codes identify anonymized excerpts.

ijbmc.org
E-ISSN: 2345-5802

Administrators' Perspectives

Developing Digital Literacy Knowledge

Administrators described limited access to professional learning and hesitation about adopting unfamiliar tools. Some attributed this hesitation to perceived complexity and additional workload.

"Some experienced teachers may feel hesitant about adopting unfamiliar digital teaching approaches, particularly when these technologies are perceived as increasing instructional complexity or workload." (A1)

"Sometimes, administrative departments adopt these technologies merely to make their own work more convenient, which imposes additional burdens on teachers beyond teaching, such as completing various forms in specific formats, causing older teachers to resist these information tools even more." (A4)

Suggested responses included accessible professional training, changes in attitudes toward technology, and practical instructional guidance.

"If there are professional training and guidance within the university, such as face-to-face, it would be much more effective." (A2)

"Older teachers generally have rich teaching experience but lack systematic training in information technology. We are exploring ways to improve this situation." (A3)

These accounts linked hesitation to the conditions under which technologies were introduced, including workload and opportunities to learn.

Applying Digital Skills

Administrators reported reliance on basic devices and software, uncertainty about which skills to develop, and difficulty changing established teaching practices.

"Our knowledge of information technology is insufficient. Many teachers can only use basic devices and software and don't even know what to learn to help themselves." (A1)

"Our teachers are not used to incorporating digital literacy into teaching. It's hard to shift from traditional habits, although we're making gradual progress." (A2)

They proposed sustained guidance and support tailored to teachers' learning needs.

"We lack sufficient knowledge and application skills, especially regarding how to use digital tools effectively in class. We need internal professional training and guidance." (A1)

The accounts distinguished the presence of digital tools from teachers' readiness to integrate them into everyday teaching.

Mastering Digital Literacy

Administrators described a shortage of practical guidance and a lack of organized, discipline-sensitive learning arrangements.

"One prominent issue is that there's a lot of theory but little time to study it. We also lack practical training and guidance from professional instructors." (A1)

"I feel lost when it comes to learning information technology. Teachers from different disciplines have different learning needs, yet the university lacks relevant learning policies or mechanisms." (A2)

They emphasized the need for targeted and coordinated support.

"We need a comprehensive and targeted mechanism that considers all aspects to truly improve teachers' digital literacy." (A1)

Integrating Technology into Teaching

Administrators described uncertainty, emotional hesitation, and limited professional support when teachers attempted to integrate technology into teaching.

"Some teachers still show emotional resistance, possibly due to fear of change or lack of courage." (A2)

They emphasized the need for expert guidance and policy support.

"We hope for professional support guaranteed by national policies and provided by qualified experts, but in reality, such training is lacking." (A4)

They also proposed including digital competence within continuing professional development.

ijbmc.org
E-ISSN: 2345-5802

"Teacher development requires coordination in many aspects. Digital literacy and ICT competence should be included in professional development plans." (A3)

"Improving digital teaching abilities requires long-term supervision, continuous learning, and even performance evaluation. Multiple strategies should be used, guided by a scientific approach." (A2)

Teachers' Perspectives

Developing Digital Literacy Knowledge

Teachers described limited foundational knowledge, insufficient institutional support, and anxiety about technical disruptions.

"Information technology feels abstract to us. We basically have no foundation in digital literacy, and there's no institutional support in this area." (B1-02)

"Sometimes, when using digital tools in class, sudden technical issues occur and interrupt my lesson. It makes me anxious, so I prefer traditional methods." (B5-04)

They proposed a systematic and accessible training mechanism.

"Currently, our digital literacy knowledge is limited to simple office software like PowerPoint. We need the university to establish a systematic and standardized training mechanism." (B1-02)

Applying Digital Skills

Teachers reported that operational demands and technical interruptions could compete with instructional attention.

"I'm still not used to teaching this way because I have to think about various operations beyond teaching, and sometimes technical errors interrupt my class. Students' participation also drops; they lose the chance to write on the board." (B1-02)

"My biggest worry is when equipment fails during class, and I don't know who to ask for help. The main problem is the lack of hands-on training and professional guidance." (B2-01)

Their suggestions emphasized a needs-based support system that connects training with classroom problems.

"The university should pay attention to the real issues in digital literacy education and build a systematic, all-around, and needs-based training system." (B1-03)

Mastering Digital Literacy

Teachers described a gap between infrastructure projects and sustained opportunities to learn how to use and adapt teaching resources.

"The university lacks a complete and standardized training system for information technology management. We see more construction projects than actual training." (B2-02)

"The school provides ready-made teaching materials, which is convenient, but when I try to modify them or adopt new methods, I find it difficult because my ability is limited." (B3-01)

They proposed incorporating digital literacy into continuing professional development and emphasizing active practice.

"Society is constantly advancing, and we should learn to master modern information tools. Digital literacy should be part of teachers' professional development plans." (B3-04)

"The university should develop clear plans to enhance teachers' ICT knowledge, address real challenges, and design systematic programs with active participation, less theory, more practice." (B5)

Integrating Technology into Teaching

Teachers recognized potential instructional benefits but described difficulty obtaining relevant guidance.

"In my teaching, I find that information technology tools are effective, especially when producing engaging videos, but this requires professional training." (B1-04)

"I want to learn how to present my lessons more effectively like some examples I see online, but I don't know whom to ask." (B3-02)

They proposed regular training by internal ICT specialists, supplemented by opportunities to learn from external experts.

ijbmc.org
E-ISSN: 2345-5802

"In remote regions like ours, we need internal ICT experts to conduct regular training so that we can interact and learn efficiently." (B1-03)

"Regular external lectures are important, especially from cities like Beijing and Shanghai where technologies are more advanced. I'd like to learn from them." (B3-02)

Cross-Cutting Barriers

Four interconnected themes were identified across the interviews: lack of institutional mechanisms, insufficient institutional priority, psychological resistance, and limited integration of digital tools into teaching (Table 4). These themes summarize participants' perceptions; they do not establish the frequency of the barriers across Qinghai or a causal sequence among them.

Table 4

Cross-cutting barriers to digital literacy development

Barrier	Meaning in participants' accounts
Lack of institutional mechanisms	Fragmented training arrangements, unclear learning pathways, and limited sustained professional guidance.
Insufficient institutional priority	Limited attention to digital literacy in continuing professional development and everyday institutional arrangements.
Psychological resistance	Hesitation, technological anxiety, and uncertainty when changing familiar teaching practices.
Limited integration into teaching	Reliance on basic operations and difficulty adapting digital resources to disciplinary instruction.

Note. Themes summarize interview accounts and do not indicate prevalence or causal relationships.

Lack of mechanisms concerned the organization of sustained training, access to guidance, and clear development pathways. Insufficient priority concerned the place of digital literacy in everyday institutional decisions and professional development. Psychological resistance included hesitation, anxiety about technical failures, and uncertainty about changing familiar teaching practices. Limited integration concerned reliance on basic functions and difficulty adapting resources to disciplinary teaching needs. The accounts suggest that these experiences can coexist: uncertainty about available support may accompany hesitation, while access to equipment may coexist with limited opportunities for practical learning.

Participant-Proposed Improvement Approaches

Participants proposed three broad approaches: stronger policy and incentive arrangements, diversified professional learning, and motivational support (Table 5). These proposals emerged from accounts of local difficulties and desired assistance. Their effects were not tested in this study.

Table 5

Participant-proposed improvement approaches

Proposed approach	Main components
Policy and incentive arrangements	Recognize digital competence in professional development; clarify responsibilities and coordinate access to support.
Diversified professional learning	Offer practical and discipline-sensitive training, peer learning, internal guidance, and external expertise.
Motivational support	Provide encouragement, accessible assistance, and manageable learning tasks to support confidence and engagement.

Note. Proposed approaches were identified through interviews; their effectiveness was not evaluated.

Policy-related proposals included recognizing digital competence within professional development plans, clarifying responsibilities, and coordinating access to expertise. Learning-related proposals emphasized regular in-house guidance, discipline-sensitive workshops, peer exchange, and opportunities to practise. Motivational proposals concerned encouragement, accessible help, and support that makes unfamiliar teaching tasks manageable. Administrators emphasized coordination and longer-term planning, while teachers' accounts repeatedly connected improvement with concrete classroom needs and reliable assistance.

Ijbmc.org
E-ISSN: 2345-5802

Discussion and Conclusion

Institutional Support and Meaningful Use

The central finding is that participants described digital literacy as an institutional and pedagogical concern as well as an individual skill. Accounts of fragmented training and uncertain assistance help explain why investment in resources may not be experienced as sufficient support. Research on accounting faculty similarly situates resistance within the conditions surrounding educational technology adoption, while research on assessment practices emphasizes teachers' beliefs and instructional purposes (Romero Alonso et al., 2019; Watty et al., 2016). These comparisons support examining the fit between tools, teaching tasks, and institutional arrangements without assuming identical barriers across settings.

A review of higher education digital transformation also identifies organizational and faculty-related challenges, providing a broader context for the present accounts (Sahni et al., 2025). The distinction between infrastructure and pedagogical use is consistent with educator competence frameworks that extend beyond operating technology (Redecker, 2017). In this study, the relevant issue was not simply whether teachers could access digital resources, but whether they had sustained opportunities and guidance to use them for their own teaching.

Clear institutional priorities, coordinated responsibilities, and space for experimentation may help connect resources with day-to-day teaching needs (Seyed Alitabar, 2022). For the participating universities, this suggests treating digital literacy as continuing faculty development rather than a series of isolated implementation tasks. Such arrangements require local evaluation and should account for workload as well as desired digital capabilities.

Psychological Readiness and Professional Support

Participants' hesitation was often described alongside workload, operational complexity, and concern about failures during lessons. Treating these accounts solely as unwillingness to change would overlook their practical context. A systematic review of teacher technostress identifies technological conditions, workplace demands, and personal appraisals as relevant sources of strain, while noting limitations in evidence about mitigation (D. Yang et al., 2025). The present interviews are compatible with that broader account but did not measure technostress or test psychological mechanisms.

Professional learning should address uncertainty and confidence as well as operational skills. Research on teachers' technology-related stress and psychological adjustment supports attending to the working conditions and emotional demands that accompany new technologies (Hashemi et al., 2026; D. Yang et al., 2025). In Qinghai, this could include accessible help during implementation, opportunities to practise without immediate high-stakes evaluation, and feedback that recognizes incremental progress. The present interviews support considering these approaches, although their effects on anxiety or competence remain to be evaluated.

Mandatory technology use also requires careful consideration of teachers' engagement and the purposes of implementation (Yeung et al., 2012). Clear expectations may be useful, but evaluation requirements should be accompanied by time, assistance, and opportunities to develop competence. Participants' requests for encouragement and manageable learning tasks suggest a practical basis for supportive rather than exclusively compliance-oriented development.

Practice-Oriented Learning and Digital Mentorship

Teachers repeatedly requested hands-on guidance and help with adapting tools to classroom needs. Work with Australian secondary technology teachers illustrates how basic digital familiarity can coexist with lower confidence in more demanding tasks and highlights practice and collaboration in professional learning (Cosby et al., 2023). That setting differs from Qinghai higher education, so the comparison supports a training principle rather than a directly transferable program. Collaborative learning research likewise offers a basis for designing opportunities to exchange knowledge and work jointly with technology (Resta & Laferrière, 2007).

ijbmc.org
E-ISSN: 2345-5802

Digital mentorship could offer sustained guidance when access to specialists is intermittent. Effective communication, accessible tools, and attention to the mentor–mentee relationship are relevant to designing this support (Seyed Alitabar & Zadhasn, 2023). A local scheme could combine regular feedback and remote contact with in-person help where feasible. Mentor responsibilities and time commitments should be explicit, and evaluation should examine participation, classroom use, and unintended workload.

Training could combine an initial needs assessment, small teaching tasks, guided practice, peer feedback, and follow-up assistance. Different disciplines and starting levels should inform task selection. A review of school digital capacity emphasizes the interaction of institutional and individual conditions, reinforcing the need to examine support systems rather than treat workshops as isolated events (Timotheou et al., 2023). Prospective evaluation would be needed to establish whether any proposed combination improves competence, teaching practice, or teacher well-being.

Limitations and Future Research

The purposive sample comprised 20 participants from four universities and supports contextual interpretation rather than statistical generalization. Institutional anonymity protects participants but limits detailed comparison of resources and policies. Interview accounts may be affected by recall, social desirability, and the dynamics of focus group interaction. The study did not include classroom observations, independent assessments of digital competence, or student learning outcomes. Reported barriers therefore reflect participants' experiences and interpretations rather than verified institutional performance indicators.

The interviews took place in March and April 2022. Subsequent changes in infrastructure, professional development, and educational technologies may alter the relevance of particular experiences. Later literature is used to interpret and contextualize the findings; it does not describe technologies necessarily discussed in the original interviews. The proposed strategies were not implemented or evaluated. Comparative and longitudinal studies could combine interviews, observations, and competence assessments to examine how institutional support and teachers' experiences change over time.

Conclusion

Administrators and teachers at four Qinghai universities described digital literacy development as constrained by fragmented institutional mechanisms, limited priority, psychological hesitation, and difficulty integrating tools into teaching. Their proposals centered on coordinated policy support, sustained and practical professional learning, and encouragement with accessible guidance. These findings support a contextual approach to faculty development that connects institutional arrangements with teachers' instructional needs. The proposals remain candidates for local implementation and evaluation, rather than established solutions or evidence of causal effects.

Acknowledgments

The authors express their gratitude and appreciation to all participants.

Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants. Ethical considerations in this study were that participation was entirely optional.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

Funding

This research was carried out independently with personal funding and without the financial support of any governmental or private institution or organization.

Authors' Contributions

All authors equally contribute to this study.

References

Aldunate, R., & Nussbaum, M. (2013). Teacher adoption of technology. *Computers in Human Behavior*, *29*(3), 519–524. https://doi.org/10.1016/j.chb.2012.10.017

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Carter, N., Bryant-Lukosius, D., DiCenso, A., Blythe, J., & Neville, A. J. (2014). The use of triangulation in qualitative research. *Oncology Nursing Forum*, *41*(5), 545–547. https://doi.org/10.1188/14.ONF.545-547

Cosby, A., Fogarty, E. S., & Manning, J. (2023). Digital literacy and digital self-efficacy of Australian technology teachers. *Education Sciences*, *13*(5), Article 530. https://doi.org/10.3390/educsci13050530

Hashemi, M., Ebrahimi, F., & Hashemi, F. (2026). English language teachers' psychological responses to AI integration: A grounded theory approach. *International Journal of Body, Mind and Culture*, *13*(1), 46–54. https://doi.org/10.61838/ijbmc.v13i1.1149

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Sage. https://us2.sagepub.com/en-us/nam/naturalistic-inquiry/book842

Redecker, C. (2017). *European framework for the digital competence of educators: DigCompEdu* (Y. Punie, Ed.). Publications Office of the European Union. https://doi.org/10.2760/159770

Resta, P., & Laferrière, T. (2007). Technology in support of collaborative learning. *Educational Psychology Review*, *19*(1), 65–83. https://doi.org/10.1007/s10648-007-9042-7

Romero Alonso, R., Riquelme Plaza, I., & Halal Orfali, C. (2019). Barriers in teacher perception about the use of technology for evaluation in higher education. *Digital Education Review*, *35*, 170–185. https://doi.org/10.1344/der.2019.35.170-185

Sahni, S., Verma, S., & Kaurav, R. P. S. (2025). Understanding digital transformation challenges for online learning and teaching in higher education institutions: A review and research framework. *Benchmarking: An International Journal*, *32*(5), 1487–1521. https://doi.org/10.1108/BIJ-04-2022-0245

Sánchez-Cruzado, C., Santiago Campión, R., & Sánchez-Compaña, M. T. (2021). Teacher digital literacy: The indisputable challenge after COVID-19. *Sustainability*, *13*(4), Article 1858. https://doi.org/10.3390/su13041858

Seyed Alitabar, S. H. (2022). The role of digital leadership in shaping an innovative organizational culture. *Journal of Technology in Entrepreneurship and Strategic Management*, *1*(1), 45–57. https://doi.org/10.61838/kman.jtesm.1.1.5

Seyed Alitabar, S. H., & Zadhasn, Z. (2023). Digital mentorship: Mentor-mentee relationships in virtual spaces. *AI and Tech in Behavioral and Social Sciences*, *1*(2), 12–18. https://doi.org/10.61838/kman.aitech.1.2.3

Timotheou, S., Miliou, O., Dimitriadis, Y., Villagrá Sobrino, S., Giannoutsou, N., Cachia, R., Martínez Monés, A., & Ioannou, A. (2023). Impacts of digital technologies on education and factors influencing schools' digital capacity and transformation: A literature review. *Education and Information Technologies*, *28*(6), 6695–6726. https://doi.org/10.1007/s10639-022-11431-8

Watty, K., McKay, J., & Ngo, L. (2016). Innovators or inhibitors? Accounting faculty resistance to new educational technologies in higher education. *Journal of Accounting Education*, *36*, 1–15. https://doi.org/10.1016/j.jaccedu.2016.03.003

Yang, D., Liu, J., Wang, H., Chen, P., Wang, C., & Metwally, A. H. S. (2025). Technostress among teachers: A systematic literature review and future research agenda. *Computers in Human Behavior*, *168*, Article 108619. https://doi.org/10.1016/j.chb.2025.108619

Yang, L., García-Holgado, A., & Martínez-Abad, F. (2023). Digital competence of K-12 pre-service and in-service teachers in China: A systematic literature review. *Asia Pacific Education Review*, *24*(4), 679–693. https://doi.org/10.1007/s12564-023-09888-4

Yeung, A. S., Taylor, P. G., Hui, C., Lam-Chiang, A. C., & Low, E.-L. (2012). Mandatory use of technology in teaching: Who cares and so what? *British Journal of Educational Technology*, *43*(6), 859–870. https://doi.org/10.1111/j.1467-8535.2011.01253.x