

Digital Empowerment of Student Teachers: A Critical Review and Its Relevance in Today's Digital World

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ABSTRACT

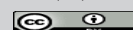
In an era where technological integration is reshaping global education systems, the digital empowerment of student teachers emerges as a crucial factor in shaping the future of teaching and learning. This paper critically reviews the concept of digital empowerment in educational contexts, particularly focusing on student teachers. Relevant literature and empirical findings have been analyzed that highlight the evolution, dimensions, and significance of digital empowerment and its imperative role in preparing student teachers to navigate and lead within increasingly digital learning environments.

Keywords: Digital Empowerment, student teachers, teacher education

The modern educational landscape is being rapidly transformed by digital technologies. This shift demands that educators, especially student teachers, be not only digitally literate but also digitally empowered. While the term 'empowerment' has its roots in the civil rights movements of the mid-20th century (Perkins, 2010), its adaptation into digital contexts offers a new paradigm of equipping individuals with the tools, motivation, and access necessary to function effectively in a digitally dominant society. This paper provides a critical review of the digital empowerment of student teachers and emphasizes its significance in the contemporary educational framework.

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Understanding Digital Empowerment

Originally conceptualized to address social inequalities (Solomon, 1987), empowerment has evolved to encompass digital dimensions, enabling individuals to access, use, and benefit from digital technologies (Akkoyunlu & Yilmaz, 2011). Digital empowerment is not merely about acquiring technical skills but involves awareness, motivation, access, and the ability to apply technology meaningfully in educational settings (Mäkinen, 2006).

Further, integrating digital tools does not replace the teacher but enhances their ability to educate in transformative ways. As Prensky (2009) argues, the fusion of technology with human intelligence produces ‘digitally wiser’ individuals. The need for this hybrid intelligence is even more pressing given global trends pointing to the transformation of nearly a third of all jobs due to technological shifts (World Economic Forum, 2020).

Measuring Digital Empowerment

The development of various digital empowerment scales demonstrates the effort to quantify and understand the phenomenon. Mäkinen (2006) introduced a foundational model based on *awareness, technical access, motivation, and skills* as prerequisites for achieving digital empowerment. Akkoyunlu *et al.* (2010) adapted this into a Likert scale primarily standardized on university students, which was later widely applied to teacher education settings.

Subsequent scales diversified the measurement landscape by including *psychological, legal, and economic* dimensions (Kirti & Singh, 2017), while Kong *et al.* (2019) introduced *beliefs in creativity and competence*. Furthermore, Irwansyah *et al.* (2024) introduced humanistic aspects, such as *social contractual utilitarianism, social contractual egalitarianism and gratifications*, providing a broader view of digital empowerment that aligns with evolving socio-technical contexts. Most recently, Tamang & Reddy (2024) have developed and standardized a scale, viz. Student Teachers Digital Empowerment Scale (STDES) specifically for student teachers by adding a new dimension, ‘*digital security and Ethical use of Technological Resources*’, which will help the student teachers in their academic and personal lives to be self-protected as well as to safeguard the digital safety of others in the digital landscape. Nevertheless, all the above scales are based on self-reporting by the respondents; such a scale’s findings, however, suffer from respondents’ bias, thus influencing the obtained result.

Digital Empowerment in Teacher Education

The importance of equipping student teachers with digital capabilities has been emphasized in multiple studies. As Ray Clifford quotes, “*Technology won’t replace teachers, but teachers who do not use technology will be replaced*”. Thus, teachers who fail to adopt technological tools risk obsolescence in a digitized world. Hence, effective integration of ICT is essential to cultivate

21st-century learning environments (Fisher, 2000) and requires teacher education programs to prioritize digital training (Birch & Irvine, 2009).

Additionally, digital empowerment in teacher education is positively correlated with self-efficacy (Sarýçoban, 2012), information literacy (Akkoyunlu & Yilmaz, 2011), and perceived computer usage among university students (Akturk & Emlek, 2016). These findings reinforce that digital empowerment is not a static trait but an evolving capacity influenced by beliefs, training, and exposure.

Digital Empowerment and Equity

Research findings highlight that digital empowerment can transcend socio-economic and geographic barriers when institutions provide equitable access. Aslan (2021) and Liu (2024) both affirm that university infrastructure and institutional support can leverage the digital standards by offering their learners the same opportunities for digital empowerment regardless of background. Moreover, findings from Hans (2018) show that integrating smart technologies into skill-based activities can build confidence among disengaged learners, further indicating the transformative power of digital empowerment.

Digital Empowerment and Gender

Gender was once assumed to be a defining factor in digital empowerment and digital literacy. However, numerous studies (İncelenmesi *et al.* 2017; Varghese & Arya, 2024; Eynur, 2016; Shridhar & Thippesh, 2023) have found no significant differences in digital empowerment between male and female students, indicating a diminishing gender gap in this domain.

Digital Empowerment and Ownership of Personal Computer/Laptop

Both quantitative research and conceptual research findings have shown that computer accessibility (Goktas *et al.* 2009; Tezci, 2011), ownership of personal computers (Demirtaş & Mumcu, 2021, Tezci, 2011; Tamang & Reddy, 2025) and ICT infrastructure (Iyengar *et al.* 2017) act as strong predictors for leveraging digital empowerment, ICT competencies and digital literacy among the users.

Critical Reflections

While digital empowerment is widely acknowledged as essential, its integration in teacher education is often inconsistent and dependent on institutional commitment. The limited focus on teacher-specific digital empowerment models suggests a disconnect between research and policy implementation. Furthermore, while many studies confirm the benefits of digital empowerment, few examine the longitudinal impact on teaching practice and student outcomes.

Moreover, as education systems become increasingly digitized, there is a risk of widening the digital divide if empowerment initiatives do not reach all student teachers equitably. Institutions must therefore not only provide access but also foster intrinsic motivation and confidence through inclusive digital pedagogy and contextualized training focusing on uplifting the digital literacy among prospective teachers.

CONCLUSION

Digital empowerment is no longer a supplementary skill but a core competency for student teachers. As digital natives enter the classroom, the role of teachers must evolve to guide, mediate, and inspire through technology. Future research must focus on developing robust, context-sensitive digital empowerment frameworks and scales tailored to teacher education. Only then can we ensure that student teachers are truly equipped to thrive and lead in the digital age.

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