Journal of Learning Development in Higher Education
ISSN: 1759-667X
Issue 39: March 2026
https://doi.org/10.47408/jldhe.vi39.1673

PAPER

Lecturers' perceptions of ICT integration in a South African private higher education faculty of education

Shaylen Naidoo

The IIE's Emeris Sandton, South Africa

ABSTRACT

This study investigates lecturers' perceptions of ICT integration within a South African Faculty of Education. Employing a mixed-methods approach guided by the TPACK, TAM, and DigCompEdu frameworks, data were collected from a census of 56 academic staff. The findings reveal a complex interplay between infrastructural provision and digital inequities. While lecturers indicated high technological self-efficacy, its translation into effective practice was mediated by a misalignment between the technologies promoted and the institutional context. Key constraints included curriculum overload, variable technical support, and a critical disconnect between the chosen technologies and student accessibility. Despite these barriers, emergent peer collaboration and strategic optimism indicate a nascent shift towards transformative practice. The study concludes that for ICT integration to be effective, institutional strategy must evolve from a techno-positive provisioning model to one that prioritises contextually appropriate and accessible digital pedagogy.

KEYWORDS: ICT integration, TPACK, TAM, DigCompEdu, professional development, educational development, South Africa.

ARTICLE HISTORY: Received 4 August 2025. Accepted 12 February 2026.

Introduction

The integration of information and communication technology (ICT) is a strategic priority in South African higher education, aimed at pedagogical modernisation and widening

participation (Ajani & Maphalala, 2023; Enaifoghe et al., 2021; Maphalala & Adigun, 2021; Mavuso & Makeleni, 2022; Naidoo, 2020; Shava, 2022). ICT is central to enhancing teaching and learning and broadening educational access. Its adoption in South Africa is particularly significant given enduring systemic challenges, including limited public university capacity, infrastructural inequities, and socio-economic disparities in access (Aruleba & Jere, 2022; Shava, 2022). While this study employs the term ICT, current discourse increasingly references digital technologies and digital literacies such as artificial intelligence (Haleem et al., 2022; Saif et al., 2022), reflecting a shift towards broader and more adaptive forms of digital pedagogy. Private higher education institutions (PHEIs) have often led this digital transformation (Bird, 2020; Essop, 2020; Mugobo, 2021; Myburgh, 2021). Within faculties of education, effective ICT integration is essential for preparing future teachers, requiring both technological access and pedagogical competence that is contextually responsive. This study extends beyond generalised accounts of barriers to examine lecturers' perceptions and lived experiences within a South African PHEI Faculty of Education.

Drawing on the Technological Pedagogical Content Knowledge (TPACK) framework, the Technology Acceptance Model (TAM), and the Digital Competence Framework for Educators (DigCompEdu) the research examines the interplay between access, training, and pedagogical integration of ICT. By foregrounding the lived experiences of both full-time and part-time faculty, this inquiry seeks to inform context-responsive strategies for inclusive digital pedagogy in private higher education. For the purpose of this study, ICT is operationalised as the suite of institutionally-provided digital hardware and software. However, the analysis is framed by an understanding that its integration is a complex socio-technical process, necessitating a critical view of its pedagogical value, alignment with digital competencies (Punie & Redecker, 2017), and contribution to equitable and accessible learning.

Literature review

The integration of ICT has become a strategic imperative in South African higher education, which reflects global movements towards pedagogical modernisation and the national pursuit of inclusive participation (Naidoo, 2020; Shava, 2022). ICT is positioned as a vehicle for enhancing access and cultivating digital literacy within teacher training (Naidoo, 2020). However, the South African higher education landscape remains characterised by deep socio-

economic and infrastructural disparities (Shava, 2022). Even where institutional investment is significant, socio-economic inequalities, such as home connectivity, device ownership, or digital literacy continue to undermine equitable student participation. Policies must therefore conceptualise access as a socio-technical phenomenon encompassing cultural and economic dimensions rather than as a purely material provision (Aruleba & Jere, 2022; García-Peñalvo et al., 2020; Laurillard, 2013).

Persistent inequities in ICT access mirror broader social and economic divisions. South African higher education is marked by stark resource disparities in digital infrastructure, a divide evident between urban and rural areas as well as between public and private institutions (Ajani & Maphalala, 2023; Maphalala & Adigun, 2021; Pitikoe-Chiloane et al., 2022). This digital divide constrains both lecturers' and students' engagement with online pedagogies, limiting the democratic potential of digital education (Chisango et al., 2020). Some PHEIs in South Africa have attempted to mitigate access barriers through collaborations with organisations such as the Council for Scientific and Industrial Research (CSIR) to foster innovative and flexible modes of delivery (Mkuti & Aucamp, 2024). Nonetheless, sustainable ICT integration requires ongoing infrastructural investment and responsive technical support alongside policy frameworks that recognise digital access as a right rather than a privilege (Graham et al., 2020).

Institutional leadership and governance play a decisive role in shaping the conditions for ICT integration. Effective digital transformation depends on coherent policy direction, adequate resourcing, and an organisational culture that values innovation and collaboration (Ahsan, 2024; Kolasani, 2023). Professional development initiatives are most effective when they combine technical competence with pedagogical reflection, are embedded in disciplinary practice, and extend beyond isolated workshops (Reeves & Crippen, 2021). Support mechanisms such as mentorship and peer networks enhance lecturers' engagement and sustain institutional capacity (Haleem et al., 2022; Mavuso & Makeleni, 2022). Aligning institutional strategies with teaching practice through the inclusion of ICT competencies in performance frameworks reinforces accountability and coherence (Ajani & Maphalala, 2023; Maphalala & Adigun, 2021).

Recent scholarship in educational technology reflects a decisive move away from technicist accounts of ICT competence towards socially situated and pedagogically intentional digital

practice (Facer & Selwyn, 2021). Within this shift, digital integration is increasingly framed as a matter of disciplinary responsiveness and ethical responsibility rather than as the accumulation of discrete technical skills. Critical Digital Pedagogy advances this position by interrogating the socio-political dimensions of technological reform, which questions whose knowledge is legitimised and whose participation is constrained within digitally mediated environments (Redecker, 2017). From this perspective, technology is not inherently emancipatory; its effects are contingent upon institutional design and power relations. Concomitantly, accessibility has emerged as a central axis of equity in higher education. Coverdale et al. (2024) argue that inclusive design must be embedded at the level of digital architecture rather than retrofitted as accommodation. Digital environments that fail to account for socio-economic inequality risk reproducing exclusion under the guise of innovation. The literature therefore positions equitable ICT integration as a socio-technical undertaking that demands structural intentionality and critical reflexivity.

The psychological and affective dimensions of ICT adoption are equally important. Lecturers' self-efficacy—their confidence in their ability to use technology effectively—directly influences both uptake and sustained engagement (Omar & Ismail, 2021; Zhang et al., 2023). Positive attitudes shaped by perceived usefulness and relevance support and encourage experimentation, whereas fear of failure and previous negative experiences often lead to resistance (Delgosha & Hajiheydari, 2020; Sharma & Saini, 2022). Creating a culture that rewards innovation, allows for safe experimentation, and acknowledges the affective labour involved in pedagogical change can strengthen lecturers' confidence and motivation (Fernández-Batanero et al., 2021). As Islam et al. (2022) contend, institutional narratives should highlight the transformative potential of ICT as a means of fostering engagement and creativity rather than focusing on it as a compliance requirement.

At the pedagogical level, ICT integration entails a transformation in teaching philosophy from didactic to student-centred approaches (Bedenlier et al., 2022; Shava, 2022). When appropriately implemented, digital tools support collaboration and interactivity, which extends access to resources and fosters engagement. However, Ajani and Maphalala (2023) and Graham et al. (2020) point out that the process remains fraught with challenges: limited technical training, heavy workloads, curriculum overload, and resistance to change frequently inhibit innovation. Effective integration requires reflective experimentation and the

willingness to reimagine established practices. When these conditions are met, ICT has been shown to enhance learning outcomes and promote pedagogical creativity (Saif et al., 2022).

Despite tangible progress, ICT integration in South African higher education continues to be constrained by persistent structural and psychosocial barriers. On the one hand, many institutions, particularly those serving historically disadvantaged populations, still struggle with inadequate connectivity, outdated systems, or insufficient maintenance (see Enaifoghe et al., 2021; Shava, 2022).On the other hand, Govender & Mpungose (2022), Entsie et al. (2025), and Holler et al. (2023) indicate that heavy teaching loads and curriculum rigidity are some of the factors that restrict the capacity for pedagogical innovation. Addressing these challenges requires a systemic and empathetic approach to professional development that builds competence while recognising the complexities of context and workload.

Empirical studies within South African faculties of education illustrate these interrelated challenges. At the University of Pretoria, Taole et al. (2024) found that online supervision via Microsoft Teams was hindered by poor network reliability and limited platform familiarity, highlighting the interplay between infrastructural and pedagogical barriers. Similarly, research by Kanyinji (2021) revealed that pre-service teachers frequently used digital tools such as PowerPoint and video resources but lacked the confidence to integrate them independently, primarily due to insufficient exposure and limited training. These examples underscore that successful ICT integration in teacher education depends on the confluence of professional preparation and self-efficacy, all situated within a broader context of systemic digital inequity.

Conceptual framework

This study is situated at the intersection of three complementary theoretical models that together provide a robust lens for analysing ICT integration in higher education.

The primary foundation draws on the TPACK framework (Mishra & Koehler, 2006), which articulates the interdependent relationship between technological knowledge, pedagogical strategies, and subject content expertise. It asserts that effective ICT integration requires lecturers to possess nuanced understandings of how digital tools can support disciplinary learning in ways that are pedagogically sound and contextually appropriate. This model is particularly pertinent in faculties of education, where the modelling of ICT-infused practice has a generational impact on future teachers.

Complementing this, the TAM (Davis, 1989) foregrounds the psychological and perceptual factors influencing an individual's acceptance and use of technology. It posits that two key variables—perceived usefulness and perceived ease of use—predict technology adoption behaviour. Within the present study, TAM enables a critical exploration of lecturers' motivations and self-efficacy as they navigate ICT implementation within institutional and curricular constraints.

To translate these theoretical commitments into an analytic structure, the study draws on the DigCompEdu (Punie & Redecker, 2017) as a competency-based reference model. Within this inquiry, DigCompEdu is used to categorise and interpret lecturers' reported practices across six domains (viz. professional engagement, digital resources, teaching and learning, assessment, empowering learners, and facilitating learners' digital competence). It therefore functions as a classificatory and evaluative scaffold through which varying levels of pedagogical enactment can be analysed.

Finally, the principles associated with Critical Digital Pedagogy are incorporated at the level of interpretive analysis rather than theoretical exposition. Specifically, they inform the examination of whether reported ICT practices reproduce or mitigate inequities in access or participation. In this framework, accessibility is operationalised as a criterion for evaluating the inclusivity of digital integration, particularly in relation to students with disabilities and those experiencing material constraints. This ensures that the study's analytic lens extends beyond competence and adoption to include the inclusive dimensions of digital practice.

Questionnaire items and thematic interpretations for this study were explicitly mapped to these interconnected frameworks—TPACK, TAM, DigCompEdu, and the principles of Critical Digital Pedagogy—to inform a holistic analysis and reporting of the findings.

Methods

Institutional context and ICT infrastructure

The study was conducted within a Faculty of Education at a medium-sized, urban South African PHEI. The PHEI has various campuses, which provide Wi-Fi coverage via the Eduroam network in all teaching venues and common areas. The primary Learning Management System (LMS) is Brightspace, supported by institutional licences for MS

Teams (for communication and synchronous online sessions) and Academia (for results capture). Access to other online engagement tools (e.g., Mentimeter, Kahoot, Blooket, Padlet) is at the lecturer's discretion. A laptop or tablet loan scheme is not available for students. Standard teaching venues are equipped with an overhead projector and sound system. A small number of lecture venues contain SMART Technologies smart boards. Teaching sessions are delivered to in-person cohorts, but the PHEI also offers an online option for a remote cohort via Microsoft Teams.

Research design and approach

The study targeted the entire population of full-time and part-time lecturers (n=117) employed within the Faculty of Education at the time of data collection. A census approach was employed, inviting all eligible lecturers to participate, thereby ensuring maximal representativeness and mitigating sampling bias (Leedy & Ormrod, 2015). A bespoke questionnaire was designed for this study, drawing conceptually on validated items from the TPACK, TAM, and DigCompEdu framework but tailored to the institutional context. The survey included 23 closed-ended items (15 dichotomous questions and eight five-point Likert scales) and two open-ended prompts: 56 lecturers completed the survey, yielding a 47.86% response rate. To enable a basic analysis of how roles might influence perceptions, demographic data on employment status were collected. The sample comprised n=19 (33.92%) full-time and n=37 (66.07%) part-time lecturers. Participation was voluntary, and the potential for self-selection bias is acknowledged; it is possible that respondents held stronger views, either positive or negative, regarding ICT integration than non-respondents.

Data collection procedure

Data were gathered using a self-administered online questionnaire disseminated via institutional email platforms using Microsoft Forms. This tool was selected for its accessibility, ease of use, and automatic data collation features, which helped to reduce transcription errors. The instrument investigated four domains: (1) access to ICT hardware and software, (2) perceptions of and engagement with ICT training initiatives, (3) pedagogical practices involving ICT, and (4) attitudes towards ICT's role in higher education. Data collection occurred from 1 February 2025 to 31 May 2025, timed to coincide with active teaching to capture authentic

practice. To encourage candid responses and mitigate social desirability bias, the survey was entirely anonymous; no user IDs or other identifying information were collected at any point.

Ethical considerations

This study received full ethical approval from a research ethics committee (Reference number: R.0002117 [REC]). All procedures adhered to the ethical standards of research involving human participants. Informed consent was obtained electronically from all participants prior to data collection. Participation was voluntary, and anonymity and confidentiality were maintained throughout. No identifying information, apart from employment status, was collected, and data were stored securely in compliance with institutional data protection protocols.

Data analysis

Data analysis employed a dual-methodological approach. Quantitative data were subjected to descriptive statistical analysis, while qualitative responses were thematically analysed using Braun and Clarke's (2006) six-phase model. This approach allowed for both surface-level and latent pattern recognition. Following Braun and Clarke's (2006) six-phase model, qualitative data were analysed through a transparent and iterative process.

- Phase 1: Familiarisation—the researcher read all responses several times and noted initial impressions.
- Phase 2: Generating initial codes—open coding was conducted inductively through critical reading.
- Phase 3: Searching for themes—codes were collated into potential themes according to conceptual similarity and alignment with TPACK and TAM constructs.
- Phase 4: Reviewing themes—themes were refined through cross-checking against the coded extracts and the entire dataset; overlapping categories were merged.
- Phase 5: Defining and naming themes—six final themes were defined, each with a clear analytical focus.
- Phase 6: Producing the report—vivid, representative quotations were selected to illustrate each theme in the Results section.

The thematic analysis was interpreted through the triad conceptual frameworks of TPACK, TAM, and DigCompEdu, providing analytical depth to the understanding of technological

integration and user perception. Trustworthiness was enhanced through dual coding, discussion of discrepancies, and maintenance of a detailed audit trail. Preliminary analysis was conducted to explore potential relationships between demographic variables (employment status) and key quantitative findings (e.g., self-efficacy ratings, perception of training). However, no statistically significant or thematically substantive patterns emerged from these comparisons. Consequently, the data were analysed and reported for the cohort as a whole to address the primary research questions.

Results

The findings were analysed as per the TPACK, TAM, and DigCompEdu framework and the following themes became evident.

Theme 1. The illusion of access: infrastructural provision and systemic inequities

While quantitative data indicated near-universal lecturer access to ICT (n=54, 96.42%), qualitative findings exposed a critical failure to meet the equity mandate of Critical Digital Pedagogy. This framework posits that technology must challenge, not reinforce, socio-economic hierarchies. The data reveal that the institution's techno-positive provisioning model created an 'illusion of access' that, in practice, widened the digital divide. As Lecturer 7 critically noted, the very tools meant to bridge gaps became markers of elitism:

> The type of ICT deployed—if not thoughtfully selected—can widen rather than bridge the digital divide. It must be easily accessible, inclusive, and not add to the digital divide we already face. ICT usage should not be niche and for the elite, it should accommodate our reality.

This commentary underscores the persistent influence of socio-economic stratification on access and participation. Despite institutional provisioning, lecturers frequently cited Wi-Fi unreliability and a shortage of student devices, particularly in over-enrolled cohorts. One lecturer reflected 'Wi-Fi that works for all students all the time would allow access to research and apps—without this, our students are excluded from full participation in digital learning environments' (Lecturer 6).

Another articulated the constraints within high-enrolment contexts:

> With high numbers in FoE [Faculty of Education], there is always the desire to have access to more devices. Budget is often a constraint and the devices we do

> have cannot always meet the demand, especially when more than one class is using the same tools (Lecturer 5).

These infrastructural gaps reveal an incomplete digital ecology—where material access does not guarantee meaningful or equitable engagement (García-Peñalvo et al., 2020). One lecturer linked this directly to pedagogical credibility, stating 'when the network is poor and there's insufficient IT support—especially during a live lecture—it undermines us. We look unprofessional and unprepared when in fact it's a systems failure' (Lecturer 12).

Theme 2. Professional development as fragmented pedagogical capital

Lecturer participation in institutional ICT training was universal (n=56 or 100%), but satisfaction was uneven. While n=36 (64.28%) rated the training positively, others critiqued its misalignment with differentiated pedagogical needs. One lecturer stated:

> Sometimes the training is above my basic level, and we are expected to follow along without help. It would be very welcome if training sessions were separated—one for beginners, one for intermediates. It's embarrassing to keep asking for help when everyone else seems to get it (Lecturer 10).

The universal participation in training (n=56, 100%) masked a systemic inadequacy when analysed through the DigCompEdu framework. The data suggest that training was predominantly confined to Domain 1 (Professional Engagement) and Domain 2 (Digital Resources), focusing on basic technical competence. This neglect of the higher-order domains—specifically Domain 3 (Teaching and Learning) and Domain 4 (Assessment)—meant training failed to develop the pedagogical reasoning essential for transformative practice. This fragmentation is evident in Lecturer 22's critique of 'mediocre' training that was available online, highlighting its failure to address complex pedagogical integration:

> The department (referring to the Faculty of Education) tries to keep lecturers informed and trained on use of tools and software necessary for teaching and learning but I find the trainings mediocre. Most of them are basic and available on the internet, something one can learn on one's own. I am yet to receive training on blended teaching and such (Lecturer 22).

Calls for peer-led approaches were prevalent. One lecturer proposed:

> I feel the biggest challenge is to find the capacity for all the lecturers to get together for the training sessions, especially the PTL's [part-time lecturers].

> During these sessions, perhaps lecturers should have a sharing document to fill in the app they are going to use, the module in which this will be integrated, the LO's [learning outcomes] they are covering, and proposed deadline. Content heavy modules are also more challenging to find the capacity to engage with ICT (Lecturer 21).

This emphasis on collaborative knowledge-building aligns with constructivist adult learning theory (Knowles, 1970; Knowles, 1980) and reinforces the call for distributed pedagogical leadership (Islam et al., 2022). Yet there is a general sense of institutional support:

> I feel we do get support and training, I also like that they are recorded, and that I can go back and listen to the recordings to take notes and go over things in my time and my pace, as sometimes while the training is happening it goes too fast for me to grasp. I like to take my time and navigate around what is being taught (Lecturer 30).

Others identified operational vulnerabilities. One lecturer recounted '[the institution] needs to assist lecturers a great deal further, if they want ICT to be effectively included in the smooth running of sessions' (Lecturer 12).

These incidents highlight the fragility of digital implementation when support structures are insufficiently responsive. Consistent with international studies (e.g., Redecker 2022), this response illustrates that professional development influences lecturers' pedagogical self-efficacy more than infrastructural provision alone.

Theme 3. Self-efficacy and pedagogical hybridity

While most lecturers (n=51 or 91.07%) rated themselves as 'very' or 'moderately' capable of ICT use, a minority (n=5 or 8.93%) reported low confidence. Nonetheless, all lecturers claimed at least basic troubleshooting abilities. Beyond this technical literacy, however, a more complex picture of pedagogical hybridity emerged. One lecturer observed:

> I would like to comment on the attitude of students when lecturers use ICT. This generation need change and constant redoing of lecturing strategies. I find even if I mix traditional teaching with ICT I still have them engaged. I just need to add new angles and flavours (Lecturer 8).

This reflection signals an intentional blending of modalities to enhance cognitive and affective engagement. The role of ICT in fostering deeper learning was further emphasised:

> Students really love ICT integration in the classroom, from live interactive platforms to using creative tools for formal and informal assessments. They also enjoy being showed how to use new digital tools. The correct use of ICT in learning has the potential to make learning more meaningful (Lecturer 3).

Some lecturers reflected critically on their evolving pedagogical identities and intentional design:

> ICT integration in the lecture room extends far beyond simply using a projector; it requires a careful and intentional approach. There is a fine line between effective use and overuse—technology should enhance learning, not serve as mere decoration. While lecturers must stay up to date with the latest digital tools, the goal should not be to incorporate as many as possible into a single lesson. Instead, each tool should be purposefully selected to align with the learning objectives. Striking this balance is challenging, as students quickly disengage when the same technology is used repetitively. The key lies in thoughtful integration—varying the tools, ensuring they add value, and keeping students engaged without overwhelming them (Lecturer 20).

These insights reveal that high self-efficacy fosters pedagogical experimentation and responsiveness—an assertion supported by the TPACK and TAM (Zhang et al., 2023). This observation accords with TAM's construct of 'perceived ease of use', highlighting that technological complexity dampens willingness to experiment pedagogically.

Theme 4. Temporal strain and curricular constriction

Curricular overload (n=32, 57.14%) emerged as a critical barrier, directly impacting both the 'perceived ease of use' and 'perceived usefulness' constructs of the TAM framework (Davis, 1989). When lecturers are temporally stretched, the cognitive load of experimenting with new technologies diminishes their perceived ease of use. Consequently, they adopt a utilitarian calculus, where ICT is only deemed useful if it demonstrably reduces workload, not necessarily if it enhances learning. This stifles the iterative reflection and experimentation required to develop integrated TPACK. As Lecturer 13 stated:

> There are tools we could use but setting up these tools adds to a very full schedule and [I am] not really seeing the value other than making the class more fun. I would rather have access to better marking tools and presentation tools, video archives, etc, to enhance my teaching. But now I have to make use of YouTube, for example, and it is not very effective (Lecturer 13).

This utilitarian view reveals a pragmatic calculus: ICT is more likely to be adopted when it demonstrably reduces workload. One lecturer put it plainly:

> I think many do not have the capacity for this—I know, because it took me some time to actively integrate technology in my theory-heavy modules…. I do however feel that students' various backgrounds shape their attitudes to engage with ICT. Some find the device or app challenging and struggle to reach a state of flow when engaging in these activities. More needs to be done to bridge this gap (as I for example do not have time to teach basic ICT skills and offer training in my classrooms) (Lecturer 25).

The excerpt diverges from earlier work by Laurillard (2013) in suggesting that institutional support, rather than individual motivation, remains the dominant constraint. Some lecturers proposed structural interventions: 'it will be convenient to block a day per semester that only focuses on ICT and on that day all lecturers should have at least one application that they have to integrate into their lessons' (Lecturer 21).

Institutional planning must address these systemic barriers to cultivate pedagogical innovation (Delgosha & Hajiheydari, 2020).

Theme 5. Affective disengagement and evolving technology

While all lecturers agreed that ICT enhances pedagogy (n=56 or 100%), approximately one-third (n=19 or 33.92%) reported student disengagement. As one lecturer put it 'students have commented that sometimes it [various apps and sites] could be overwhelming. Not all students have access to laptops and rely on phones in class. This is sometimes difficult for those who do not have laptops' (Lecturer 27). The instability of tools further frustrates both parties:

> Apps evolve into different avenues that is not focused on education anymore and that also becomes a problem with consistency in T&L [teaching and learning] practice. A great example is PLAYPOSIT and CLASSCRAFT that were bought over and used differently or stopped access all together (Lecturer 15).

As noted by Austin et al. (2023), authentic integration requires coherence across TPACK domains—an alignment the participant implies is presently absent. Institutions must respond with differentiated pedagogies that build resilience and reduce disaffection (Reeves & Crippen, 2021).

Theme 6. Praxis gap and strategic optimism

Despite structural barriers, many lecturers articulated aspirational visions for ICT's transformative potential. One lecturer reflected:

> My goal with ICT is to facilitate students in taking charge of their learning and challenging them to think more critically. I use ICT as a tool to scaffold this mindset and shape healthy habits that will benefit them not only in my module, but as future teachers, who can use these tools in their own classrooms and who are not merely regurgitating info, but instead, share, think and create (Lecturer 25).

Support for hybrid delivery was also strong: 'embracing a more hybrid delivery which includes online lectures would have several advantages' (Lecturer 16).

However, optimism was tempered by infrastructural frustrations:

> We have however experienced challenges with regards to our iPad integration and use of smartboards. We have limited iPads and big groups. Students often portray negative attitudes towards iPad integration as they do not have these devices themselves and do not see themselves using it in their contexts. We also only have two smartboards that are not being utilised due to lecturers not being familiar with them and faulty hardware. We are struggling to work with IT to resolve these issues. Finally, we are trying to integrate coding and robotics, but students and lecturers feel uncertain about this (Lecturer 23).

One lecturer captured the disconnect between design and functionality:

> Projectors need to be upgraded as the new projectors today can connect to your computer or devices remotely and do not need a cable. This will open up new avenues to the classroom. Also, more care needs to be made on how we position or set up our smartboards and projectors and white boards in the classroom as some classrooms have these set up in awkward and non-functional areas (Lecturer 15).

Nonetheless, organic innovations are emerging: 'at our campus we have started a peer teaching initiative that motivates lecturers to teach together and introduce ICT to one another' (Lecturer 23).

Overall, the responses converge on a praxis gap between aspirational discourse and practical implementation, confirming similar tendencies reported by Kruger (2021) in South African contexts. These findings reaffirm the importance of sustained capacity building, participatory

infrastructure design, and the embedding of ICT within pedagogical rather than purely technological paradigms (Castro-Guzmán, 2021; Van der Merwe & Mouton, 2005).

Discussion

While the institution has successfully established a baseline of reliable ICT infrastructure for staff, the data reveal that this provision alone is insufficient to guarantee equitable student access. This finding resonates with socio-technical conceptions of access (Aruleba & Jere, 2022; Shava, 2022) and García-Peñalvo et al.'s (2020) concept of a digital ecology, underscoring that true access requires addressing student-side disparities in connectivity and device ownership. The persistence of these gaps, even within a well-resourced PHEI, challenges simplistic sectoral divides (Maphalala & Adigun, 2021) and highlights a critical area for intervention informed by the equity principles of Critical Digital Pedagogy. A central strength identified is the high level of lecturer self-efficacy and strategic adaptability. Analysed through the TAM, lecturers not only perceived the technology as useful but demonstrated remarkable resourcefulness through pedagogical hybridity—intentionally blending digital and traditional methods to maintain student engagement. This pragmatic, context-driven expertise is a valuable institutional asset that extends beyond simple technical competence.

However, to integrate this asset fully, the study points to the need for evolving professional development. While universal training participation reflects a strong institutional commitment, the data suggest a strategic opportunity to shift from a focus on basic technical skills (addressing lower DigCompEdu domains) towards a more transformative model. Lecturers expressed a clear desire for tiered, peer-collaborative learning that builds capacity in the higher-order DigCompEdu domains of Teaching and Learning and Assessment, which are essential for deepening pedagogical impact. The most significant constraint on this potential is structural, not motivational. A profound temporal strain and curriculum overload necessitate a pragmatic, utilitarian approach to technology adoption, where tools are prioritised for their ability to streamline workload. This finding, consistent with other South African studies (Entsie et al., 2025; Govender & Mpungose, 2022), suggests that motivational models (e.g., Laurillard, 2013) are insufficient without first addressing these systemic barriers.

Ultimately, the study identifies a clear path forward. Lecturers' aspirational visions for ICT—aligned with Critical Digital Pedagogy and DigCompEdu—coupled with their organic peer

collaborations, provide a powerful foundation. The key to bridging the implementation gap lies in strategically aligning institutional support with this on-the-ground expertise. This involves co-creating professional development, protecting time for pedagogical innovation, and systematically addressing the student-side access inequities that currently limit the return on the institution's technological investment. For a Faculty of Education, closing this loop is not just an operational improvement but a fundamental part of its mission to model equitable and effective digital pedagogy for future teachers.

Conclusion

This research underscores that sustained ICT integration within higher education requires more than technological provision; it demands systemic alignment of infrastructure and professional learning. Lecturers display high self-efficacy and emergent pedagogical hybridity, yet systemic constraints—student access inequities, temporal pressures and unstable tools—are among factors that limit sustained enactment. The findings recommend that, practically, institutions should adopt tiered, discipline-specific professional learning, allocate protected redesign time, and remediate critical infrastructure bottlenecks. Future research should evaluate the effects of targeted professional-learning interventions using longitudinal mixed-methods and should include student-outcome measures to assess pedagogical impact. The study's institutional scope limits generalisability: replication across diverse PHEIs is recommended. Furthermore, the study's design, while capturing lecturer perceptions, did not include direct observation of teaching practice or student outcome data. Future research should incorporate these methods to critically examine the gap between rhetorical commitment to ICT and its actual pedagogical enactment in the lecture venue.

Disclosure statement

The author used the following generative AI tool in the preparation of this manuscript: Grammarly. Grammarly was used as an add-in within Microsoft Word to check spelling and grammar in real time as the author developed the manuscript. The author has complied with the journal’s principles of AI use.

Funding

This author received no funding for this research and declares no competing interest.

References

Ahsan, M. J. (2025). Cultivating a culture of learning: The role of leadership in fostering lifelong development. *The Learning Organization: An International Journal, 32*(2), 282–306. https://doi.org/10.1108/TLO-03-2024-0099

Ajani, V. O. A., & Maphalala, M. C. (2023). The impact of the COVID-19 pandemic on educational transformation in African higher education: A systematic literature review on rural universities. *International Journal of Research in Business and Social Science, 12*(8), 445–453. https://doi.org/10.20525/ijrbs.v12i8.2886

Aruleba, K., & Jere, N. (2022). Exploring digital transforming challenges in rural areas of South Africa through a systematic review of empirical studies. *Scientific African,* (16), Article e01190. https://doi.org/10.1016/j.sciaf.2022.e01190

Austin, R., Angeli-Valanides, C., Brown, M., & Taggart, S. (2023). From gatekeeper to proto-online tutor: The role of parents in digital education. *Studies in Technology Enhanced Learning*, *3*(3), 1–24. https://doi.org/10.21428/8c225f6e.8b56c2b9

Bedenlier, S., Bond, M., Buntins, K., Zawacki-Richter, O., & Kerres, M. (2020). Facilitating student engagement through educational technology in higher education: A systematic review in the field of arts and humanities. *Australasian Journal of Educational Technology, 36*(4), 126–150. https://doi.org/10.14742/ajet.5477

Bird, A. J. (2020). *The formulation of a value-added branding framework for private higher education institutions in South Africa* [Doctoral dissertation, Cape Peninsula University of Technology].

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

Castro-Guzmán, W. (2021). Challenges of professional development for technology integration in higher education. *Cuadernos de Investigación Educativa, 12*(2), 82–99. https://doi.org/10.18861/cied.2021.12.2.3090

Chisango, G., Marongwe, N., Mtsi, N., & Matyedi, T. E. (2020). Teachers' perceptions of adopting information and communication technologies in teaching and learning at rural secondary schools in Eastern Cape, South Africa. *Africa Education Review, 17*(2), 1–19. https://doi.org/10.1080/18146627.2018.1491317

Coverdale, A., Lewthwaite, S., Elglaly, Y. N., Hollier, S., Horton, S., Sonka, K., & Zimmermann, G. (2024). Advancing digital accessibility in academic and workplace education. *Frontiers in Computer Science,* (6)*,* Article 1419986. https://doi.org/10.3389/fcomp.2024.1419986

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13*(3), 319–340. https://doi.org/10.2307/249008

Delgosha, M. S., & Hajiheydari, N. (2020). On-demand service platforms pro/anti adoption cognition: Examining the context-specific reasons. *Journal of Business Research,* (121), 180–194. https://doi.org/10.1016/j.jbusres.2020.08.031

Enaifoghe, A. O., Balogun, T., & Afolabi, O. S. (2021). The Fourth Industrial Revolution: Integrating ICT in the South African education system. *Researchers World – International Refereed Social Sciences Journal, 12*(2), 34–44. https://www.researchersworld.com/index.php/rworld/article/view/471

Entsie, N. Y., Owusu-Cole, C., Agyemang, S., Danyo, J. D., Sarpong, E. A., Asante, J. S., & Darkoa, M. (2025). The untold struggles of lecturers in Ghana's colleges of education: Stresses, burn out and emotional illness. *International Journal of African Higher Education, 11*(2), 145–171. https://doi.org/10.6017/ijahe.v11i2.17667

Essop, A. (2020). *The changing size and shape of the higher education system in South Africa, 2005–2017*. University of Johannesburg, Ali Mazrui Centre for Higher Education Studies.

Facer, K., & Selwyn, N. (2021). *Digital technology and the futures of education – towards 'non-stupid' optimism*. UNESCO. https://unesdoc.unesco.org/ark:/48223/pf0000377071.locale=en

Fernández-Batanero, J. M., Román-Graván, P., Reyes-Rebollo, M. M., & Montenegro-Rueda, M. (2021). Impact of educational technology on teacher stress and anxiety: A literature review. *International Journal of Environmental Research and Public Health, 18*(2), 548–560. https://doi.org/10.3390/ijerph18020548

García-Peñalvo, F. J., Casado-Lumbreras, C., Colomo-Palacios, R., & Yadav, A. (2020). Smart Learning. *Applied Sciences, 10*(19), 6964. https://doi.org/10.3390/app10196964

Govender, R., & Mpungose, C. (2022). Lecturers' technostress at a South African university in the context of coronavirus (COVID-19). *Cogent Education, 9*(1). Article 2125205. https://doi.org/10.1080/2331186X.2022.2125205

Graham, M. A., Stols, G., & Kapp, R. (2020). Teacher practice and integration of ICT: Why are or aren't South African teachers using ICTs in their classrooms? *International Journal of Instruction, 13*(2), 749–766. https://www.e-iji.net/dosyalar/iji_2020_2_51.pdf

Haleem, A., Javaid, M., Qadri, M. A., & Suman, R. (2022). Understanding the role of digital technologies in education: A review. *Sustainable Operations and Computers*, (3), 275–285. https://doi.org/10.1016/j.susoc.2022.05.004

Holler, S., Brändle, M., & Zinn, B. (2023). How do South African TVET lecturers rate their digital competencies, and what is their need for training for a digital transformation in the South African TVET sector? *Journal of Vocational, Adult and Continuing Education and Training, 6*(1), 65–89. https://hdl.handle.net/10520/ejc-jovacet_v6_n1_a5

Islam, M. K., Sarker, M. F. H., & Islam, M. S. (2022). Promoting student-centred blended learning in higher education: A model. *E-Learning and Digital Media, 19*(1), 36–54. https://doi.org/10.1177/20427530211027721

Kanyinji, T. (2021). *Exploring preservice teachers' preparedness to integrate ICT during Life Sciences' teaching experience: A case study at a South African university* [Masters dissertation, University of the Witwatersrand]. WIReDSpace Repository. https://wiredspace.wits.ac.za/items/2f114b90-13a3-4c9e-bddb-65d21fee1af1

Knowles, M. S. (1970). *The modern practice of adult education: Andragogy versus pedagogy*. Cambridge Books.

Knowles, M. S. (1980). *The modern practice of adult education: From pedagogy to andragogy* (2nd ed.). Cambridge Books.

Kolasani, S. (2023). Leadership in business innovation and transformation: Navigating complex digital landscapes and enterprise technology ecosystems. *International Journal of Holistic Management Perspectives, 4*(4), 1–23. https://injmr.com/index.php/IJHMP/article/view/57

Kruger, A. (2024). *Integrating intelligent tutoring systems for differentiated learning in inclusive classrooms* [Masters dissertation, University of Pretoria]. UPSpace Repository. http://hdl.handle.net/2263/100506

Laurillard, D. (2013). *Teaching as a design science: Building pedagogical patterns for learning and technology*. Routledge.

Leedy, P. D., & Ormrod, J. E. (2015). *Practical research*. Pearson Education UK.

Maphalala, M. C., & Adigun, O. T. (2021). Academics' experience of implementing e-learning in a South African higher education institution. *International Journal of Higher Education, 10*(1), 1–13. https://doi.org/10.5430/ijhe.v10n1p1

Mavuso, M. P., & Makeleni, S. (2022). Enhancing the integration of information and communication technology in South African teacher education programmes. *Journal of Educational Studies* (1), 104–121. https://hdl.handle.net/10520/ejc-jeds_v2022_nsi1_a7

Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record: The Voice of Scholarship in Education, 108*(6), 1017–1054. https://doi.org/10.1111/j.1467-9620.2006.00684.x

Mkuti, S., & Aucamp, E. (2024). Contextualising the South African higher education academic interventions for student success: Challenges and opportunities. *Proceedings of the International Conference on Education Research*, South Africa, *1*(1), 1–8. https://doi.org/10.34190/icer.1.1.3108

Mugobo, V. (2021). Branding private higher education institutions in South Africa through the evaluation of current branding models. *EUREKA: Social and Humanities,* (3), 15–27. https://doi.org/10.21303/2504-5571.2021.001841

Myburgh, Z. (2021). *Quality management of reaccreditation processes in private higher education institutions in South Africa* [Doctoral dissertation, University of Pretoria]. UPSpace Repository. http://hdl.handle.net/2263/84705

Naidoo, G. M. (2020). Digital communication: Information communication technology (ICT) usage for teaching and learning. In M. Montebello (Ed.), *Handbook of research on digital learning* (pp. 1–19). IGI Global.

Omar, M. N., & Ismail, S. N. (2021). Empowering teacher self-efficacy on ICT: How does technology leadership play a role? *Malaysian Online Journal of Educational Management, 9*(3), 1–22. https://mojem.um.edu.my/index.php/MOJEM/article/view/30567

Pitikoe-Chiloane, G. M., De Jager, T., & Mokgosi, P. (2022). TVET engineering lecturers' perceptions on the application of technology tools in teaching and learning in South Africa. *The International Journal of Technologies in Learning, 29*(2), 29–41. https://doi.org/10.18848/2327-0144/CGP/v29i02/29-44

Punie, Y., & Redecker, C. (2017). *European framework for the digital competence of educators: DigCompEdu*. Publications Office of the European Union. https://publications.jrc.ec.europa.eu/repository/handle/JRC107466

Redecker, C. (2017). *European framework for the digital competence of educators*. Publications Office of the European Union.

Reeves, S. M., & Crippen, K. J. (2021). Virtual laboratories in undergraduate science and engineering courses: A systematic review, 2009–2019. *Journal of Science Education and Technology,* (30), 16–30. https://doi.org/10.1007/s10956-020-09866-0

Saif, S. M., Ansarullah, S. I., Ben Othman, M. T., Alshmrany, S., Shafiq, M., & Hamam, H. (2022). Impact of ICT in modernising the global education industry to yield better academic outreach. *Sustainability, 14*(11), Article 6884. https://doi.org/10.3390/su14116884

Sharma, S., & Saini, J. R. (2022). On the role of teachers' acceptance, continuance intention and self-efficacy in the use of digital technologies in teaching practices. *Journal of Further and Higher Education, 46*(6), 721–736. https://doi.org/10.1080/0309877X.2021.1998395

Shava, E. (2022). Reinforcing the role of ICT in enhancing teaching and learning post-COVID-19 in tertiary institutions in South Africa. *Journal of Culture and Values in Education, 5*(1), 78–91. https://doi.org/10.46303/jcve.2022.7

Taole, M., Naidu, K., Gcabashe, N., & Maphumulo, T. (2024). Supervisors' challenges with online supervision using Microsoft Teams in supervising open distance and e-learning (ODeL) pre-service teachers. *Teacher Education through Flexible Learning in Africa,* (5), 55–78. https://doi.org/10.35293/tetfle.v5i1.4530

Van der Merwe, A., & Mouton, J. (2005). Integrating ICTs into the teaching and learning environment: An investigation of lecturer perceptions of possible barriers and incentives. *Perspectives in Education, 23*(1), 19–37. https://hdl.handle.net/10520/EJC87347

Zhang, Z., Maeda, Y., Newby, T., Cheng, Z., & Xu, Q. (2023). The effect of preservice teachers' ICT integration self-efficacy beliefs on their ICT competencies: The mediating role of online self-regulated learning strategies. *Computers & Education,* (193), Article 104673. https://doi.org/10.1016/j.compedu.2022.104673

Author details

Shaylen Naidoo is a lead technology innovator and Social Sciences Education lecturer in the Faculty of Education at The Independent Institute of Education's Emeris Sandton Campus. His overall research focuses on technology-enhanced curriculum delivery within Social Sciences Education.

ORCID

Shaylen Naidoo https://orcid.org/0000-0001-9291-5176