

# Clicking into Competence: Digital Learning Platforms for Teacher Training in South African Technical and Vocational Education Curriculum



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## ABSTRACT

This study explored the role and impact of Digital Learning Platforms (DLPs) in enhancing teacher training within South Africa's Technical and Vocational Education (TVE) curriculum. Guided by a qualitative case study approach and an interpretivist perspective, data was collected using semi-structured interviews with 12 students and four lecturers actively engaged in DLPs at a South African university. Thematic analysis revealed that, while DLPs offer substantial benefits, such as increased interactivity, flexibility, and resource accessibility, many infrastructural and capacity-related challenges impede their full implementation. Participants highlighted issues including unreliable internet, limited access to devices, and inadequate digital literacy, which hinder effective use of these platforms. Despite these barriers, there is a positive outlook on the potential of DLPs to transform pedagogical practices, foster student engagement and promote professional growth among teachers. The results highlight the need for ongoing investments in digital infrastructure, regular professional training, and clear policies to ensure successful integration. Recommendations include upgrading internet connectivity, providing affordable devices, enhancing digital literacy through ongoing training, and establishing collaborative policy initiatives among stakeholders. Maximising the potential of DLPs involves addressing resistance and overcoming infrastructure and resource challenges, enabling South Africa to develop skilled teachers for high-quality vocational education in a digital economy. The study contributes to the global discourse on educational technology by emphasising the importance of contextually tailored strategies for sustainable digital integration, offering practical implications for policymakers, lecturers and researchers aiming to bridge the gap in access to technology within the TVE curriculum.

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## INTRODUCTION

Integrating digital learning platforms (DLPs) into South Africa's educational landscape has gained substantial momentum, supported by government initiatives to modernise higher education.<sup>1</sup> These platforms

<sup>1</sup> Oluwatoyin Ayodele Ajani and Sibongamandla Dlomo, "Comparative Analysis of Digital Transformation's Impact on Higher Education Institutions: A Systematic Literature Analysis of Public versus Private Sector," *Journal of Research in Higher Education* 8, no. 1 (July 4, 2024): 72–96, <https://doi.org/10.24193/JRHE.2024.1.4>.

are increasingly adopted across sectors, emphasising fostering interactive, student-centred learning environments that promote collaboration and active engagement, moving away from traditional lecture-based approaches.<sup>2</sup> Within the realm of Technical and Vocational Education (TVE), developing technologically proficient teachers is a national priority, as emphasised by Asvat.<sup>3</sup> Enhancing teacher training through digital tools like Learning Management Systems (LMS) offers promising avenues to address longstanding challenges such as resource limitations, outdated pedagogies, and inadequate professional development.<sup>4</sup>

South Africa's TVE sector addresses skills shortages and prepares students for a rapidly evolving, technology-driven economy. However, despite the curriculum's strategic importance, it grapples with significant challenges that impede its effectiveness. Many TVE programs rely on traditional, lecture-based instructional methods and are hindered by limited resources, infrastructural deficiencies, and inadequate teacher training in digital pedagogies.<sup>5</sup> The digital divide remains a persistent obstacle, with rural and underserved areas suffering from poor internet connectivity and limited access to devices, further exacerbating inequalities in educational access and quality.<sup>6</sup>

In response, policymakers and educational stakeholders have increasingly advocated integrating digital tools into the curriculum. DLPs have the potential to provide extensive, on-demand access to academic resources, facilitate interactive learning experiences, and support differentiated instruction tailored to diverse learner needs.<sup>7</sup> These platforms can transform teacher training by enabling educators to develop and deploy innovative pedagogical approaches, foster student engagement, and enhance digital literacy, an essential component of contemporary teaching competencies.<sup>8</sup> Nevertheless, implementing such platforms is often inconsistent and hampered by infrastructural gaps, limited digital skills among teachers, and resistance to change within institutions.

Despite the promising potential of DLPs to revolutionise teacher education in South Africa's TVE curriculum, their effective integration remains a significant challenge. The implementation landscape is characterised by infrastructural deficits, including unreliable internet connectivity and limited access to appropriate devices, particularly in rural and marginalised communities.<sup>9</sup> Additionally, some lecturers and students do not possess the necessary digital literacy skills to utilise these platforms effectively, which hampers their adoption and impact.<sup>10</sup> Obstacles to adopting new approaches and the absence of defined policies and institutional backing make it even more challenging to integrate digital tools into TVE teacher training programs.

This study examined the impact of DLPs on teacher training within South Africa's TVE curriculum. The purpose was to generate insights that can inform policy and practice, ensuring that digital tools contribute

<sup>2</sup> P. S. Aithal and Shubhrajyotsna Aithal, "Stakeholders' Analysis of the Effect of Ubiquitous Education Technologies on Higher Education," *International Journal of Applied Engineering and Management Letters*, May 20, 2023, 102–33, <https://doi.org/10.47992/IJAEML.2581.7000.0177>.

<sup>3</sup> Zaheera Asvat, "Grade 8 Learners' Perceptions of Implementing Technical and Vocational Education in the Curriculum (University of Johannesburg, 2019).

<sup>4</sup> Leoni CE Stroebel, Johnnie Hay, and Hermanus J Bloemhoff, "An Approach to Re-Skilling of in-Service Teachers in Physical Education in South African Schools," *South African Journal of Education* 39, no. 2 (May 31, 2019): 1–12, <https://doi.org/10.15700/saje.v39n2a1643>; Vasyl Kovalchuk et al., "Vocational Education in the Context of Modern Problems and Challenges," *Journal of Curriculum and Teaching* 11, no. 8 (November 14, 2022): 329, <https://doi.org/10.5430/jct.v11n8p329>.

<sup>5</sup> Stroebel, Hay, and Bloemhoff, "An Approach to Re-Skilling of in-Service Teachers in Physical Education in South African Schools"; Kovalchuk et al., "Vocational Education in the Context of Modern Problems and Challenges."

<sup>6</sup> Ajani and Dlomo, "Comparative Analysis of Digital Transformation's Impact on Higher Education Institutions: A Systematic Literature Analysis of Public versus Private Sector."

<sup>7</sup> Manoj Bramhe and Jagdish Pimple, "Optimizing Learning Environments," in *Cloud Computing for Smart Education and Collaborative Learning* (New York: Chapman and Hall/CRC, 2025), 173–87, <https://doi.org/10.1201/9781003472537-16>.

<sup>8</sup> V. Radkevych et al., "Modern Technologies in the Development of Professional Competence in Teachers from Professional (Vocational) Education Schools," *Journal of Physics: Conference Series* 1840, no. 1 (March 1, 2021): 012041, <https://doi.org/10.1088/1742-6596/1840/1/012041>.

<sup>9</sup> Stroebel, Hay, and Bloemhoff, "An Approach to Re-Skilling of in-Service Teachers in Physical Education in South African Schools."

<sup>10</sup> Kovalchuk et al., "Vocational Education in the Context of Modern Problems and Challenges."

meaningfully to developing competent, future-ready teachers who can address the needs of a digital economy. To reach these objectives, the study was directed by the following aims:

- To investigate the experiences of students and lecturers regarding the use of Digital Learning Platforms (DLPs) in TVE teacher training in South Africa
- To assess the extent to which DLPs influence teaching practices, student engagement, and professional development within the TVE curriculum, and
- To explore strategies and recommendations for enhancing the effective use of DLPs to support sustainable and inclusive teacher development in the South African TVE curriculum.

This study used Constructivist Learning Theory (CLT) as its framework, emphasising that learners build knowledge through engagement, reflection, and interaction.<sup>11</sup> Digital platforms like Learning Management Systems (LMS) support this approach by fostering personalised, student-centred experiences that enhance collaboration and critical thinking. CLT underlines the significance of active participation and experiential learning in teacher training, facilitated by interactive multimedia and online discussions.<sup>12</sup> This theory offers insight into how digital platforms can enhance pedagogical practices and support teachers' professional growth in South Africa's vocational education sector. The study holds significant implications for policymakers, educational institutions, and technology providers committed to advancing South Africa's TVE curriculum. By exploring the perceptions, challenges, and opportunities associated with DLPs, the study may offer evidence on how digital platforms can improve teacher training quality and inclusivity. The findings might contribute to developing targeted interventions, digital literacy programs and policies promoting sustainable digital transformation.

### **The Importance of Technical and Vocational Education (TVE)**

Technical and Vocational Education (TVE) plays an important role in shaping the future of education and industry in South Africa, particularly in its mission to develop technologically proficient teachers for technical secondary schools. Unlike traditional pathways that focus solely on preparing students to enter the workforce, TVE in this context aims to produce teachers equipped with both practical skills and advanced technological knowledge to teach in technical and vocational settings.<sup>13</sup> These teachers will be responsible for training the next generation of learners in trades, engineering, technology, and other technical disciplines, directly influencing the relevance and quality of technical education delivered in schools.<sup>14</sup>

Programs in TVE emphasise hands-on learning, practical training and the development of workspace-relevant skills, ensuring that future teachers can impart industry-standard knowledge and foster practical competencies among their students.<sup>15</sup> These programmes are offered at various levels, including technical secondary schools, colleges, and universities of technology. They are designed to address the skills gaps in the education sector, particularly in training skilled teachers who can integrate technology into their teaching practices.<sup>16</sup>

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<sup>11</sup> Jean Piaget, "The Grasp of Consciousness: Action and Concept in the Young Child: Translated by Susan Wedgwood." (Harvard University Press, 1976); Lev S Vygotsky, *Mind in Society: The Development of Higher Psychological Processes*, vol. 86 (Harvard university press, 1978).

<sup>12</sup> Khritish. Swargiary, *Redefining Reality: My Vision for an Education Rooted in Real-World Experiences* (US: ERA, 2024).

<sup>13</sup> Radkevych et al., "Modern Technologies in the Development of Professional Competence in Teachers from Professional (Vocational) Education Schools."

<sup>14</sup> Anthony T. Sibiyi and Nceba Nyembezi, "Examining Factors That Shape Technical Vocational Education and Training Engineering Students' Understanding of Their Career Choices," *Transformation in Higher Education* 3 (August 7, 2018), <https://doi.org/10.4102/the.v3i0.33>.

<sup>15</sup> Noor H. Jabarullah and Hafezali Iqbal Hussain, "The Effectiveness of Problem-Based Learning in Technical and Vocational Education in Malaysia," *Education + Training* 61, no. 5 (June 10, 2019): 552–67, <https://doi.org/10.1108/ET-06-2018-0129>.

<sup>16</sup> Denis Kintu, Kisilu Mashtakh Kitainge, and Ahmed Ferej, "An Exploration of Strategies for Facilitating Graduates' Transition to the World of Work: A Case of Technical, Vocational Education and Training Graduates in Uganda," *International Journal of Vocational Education and Training Research* 5, no. 1 (2019): 1, <https://doi.org/10.11648/j.ijvetr.20190501.11>; Shoko Yamada and Christian S. Otchia, "Perception

The strategic importance of TVE in South Africa extends beyond workforce development; it is crucial in cultivating a new generation of teachers who are skilled practitioners capable of employing innovative, technology-oriented pedagogies.<sup>17</sup> The Organisation for Economic Co-operation and Development (OECD) notes that TVE is important for preparing learners to participate in knowledge-based economies, where technology-driven teaching improves results and equips students for modern societal needs.<sup>18</sup> This is especially important in manufacturing, engineering, information technology and construction sectors, where technology-driven teaching can improve educational results and equip students to meet the requirements of modern society and, knowledge-based economy.<sup>19</sup> Equipping teachers with advanced technological skills and digital competencies ensures they can deliver high-quality, relevant instruction that meets the needs of contemporary students.<sup>20</sup> As this study highlights, fostering a new breed of technology-oriented teachers is important to transforming technical education and driving sustainable development in South Africa's educational landscape.

### Digital Learning Platforms (DLPs) for Teacher Training

DLPs have emerged as important technologies within educational frameworks, particularly in TVE programs.<sup>21</sup> These platforms have many advantages that positively impact teacher performance and job satisfaction. Through features such as interactive activities, multimedia resources and virtual discussions, teachers can engage more effectively with their students.<sup>22</sup> DLPs enable the creation of personalised learning experiences tailored to student needs, fostering an environment of creativity and ownership that significantly enhances job satisfaction.<sup>23</sup> The integration of DLPs into TVE curricula has demonstrated improvements in instructional design, facilitated by active evaluation mechanisms, customised learning pathways and flexible content delivery options.<sup>24</sup>

The widely used DLPs include Moodle, Blackboard, Google Classroom and Microsoft Teams, which provide tools for managing content, assignments and interactive discussions. These platforms allow lecturers to combine face-to-face teaching and learning with digital resources, making teacher training more dynamic and accessible. Several studies have investigated the impact of DLPs on training quality within TVE contexts. For instance, Gu found that teachers using DLPs experienced marked enhancements in lesson planning, content dissemination and assessment strategies.<sup>25</sup> Similarly, research by Mhlongo, et.al. indicated that teachers who used DLPs to incorporate interactive learning and multimedia elements achieved superior teaching and learning outcomes compared to conventional pedagogical methods.<sup>26</sup> Grewe further established

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Gaps on Employable Skills between Technical and Vocational Education and Training (TVET) Teachers and Students: The Case of the Garment Sector in Ethiopia," *Higher Education, Skills and Work-Based Learning* 11, no. 1 (April 27, 2020): 199–213, <https://doi.org/10.1108/HESWBL-08-2019-0105>.

<sup>17</sup> Flavio. Campos, "Information Technology and Vocational Education: Advances and Challenges in Curriculum Implementation.," in *Society for Information Technology & Teacher Education International Conference* (Association for the Advancement of Computing in Education (AACE), 2025), 1650–55.

<sup>18</sup> OECD, "An OECD Learning Framework 2030" (Springer International Publishing, 2019).

<sup>19</sup> OECD, "An OECD Learning Framework 2030."

<sup>20</sup> AR Saravanakumar, G.P. Raja, and P. Sivakumar, "Transforming Education: Perceptions and Challenges of Technology-Enabled Teacher Education Programmes," *Open Access Research Journal of Engineering and Technology* 5, no. 2 (October 30, 2023): 001–007, <https://doi.org/10.53022/oarjet.2023.5.2.0077>.

<sup>21</sup> N. Mbanga and V.N. Mtembu, "Digital Learning: Perceptions of Lecturers at a Technical Vocational Educational and Training College," *South African Journal of Higher Education* 34, no. 4 (September 2020), <https://doi.org/10.20853/34-4-3656>.

<sup>22</sup> Edeh Michael Onyema\* et al., "Online Discussion Forum as a Tool for Interactive Learning and Communication," *International Journal of Recent Technology and Engineering (IJRTE)* 8, no. 4 (November 30, 2019): 4852–68, <https://doi.org/10.35940/ijrte.D8062.118419>.

<sup>23</sup> Norah Adera, "Innovative Learning Spaces and Blended Learning: Quest for 21st Century Competency Teaching and Learning Approaches.," in *Creating Dynamic Space in Higher Education: Modern Shifts in Policy, Competencies, and Governance* (New York: IGI Global, 2025), 139–74.

<sup>24</sup> Mingjing Gu, "Empowering Vocational Education through Digital Technology: Innovating the Teaching Landscape," *International Journal of New Developments in Education* 6, no. 6 (2024), <https://doi.org/10.25236/IJNDE.2024.060621>.

<sup>25</sup> Gu, "Empowering Vocational Education through Digital Technology: Innovating the Teaching Landscape."

<sup>26</sup> Siyabonga Mhlongo et al., "Challenges, Opportunities, and Prospects of Adopting and Using Smart Digital Technologies in Learning Environments: An Iterative Review," *Heliyon* 9, no. 6 (June 2023): e16348, <https://doi.org/10.1016/j.heliyon.2023.e16348>.

that students in TVE programs integrated with DLPs exhibited higher engagement levels than their counterparts in traditional face-to-face settings.<sup>27</sup> The use of DLPs in TVE correlates with increased teacher satisfaction, which is important to their well-being. This points to a future where digital tools not only support effective teaching but also contribute to teacher motivation and professional growth outcomes that are vital for the continued development of quality TVE in South Africa.

### Digital Pedagogy in Enhancing Technical and Vocational Education (TVE)

Digital pedagogy represents a modern approach to education that influences digital tools and platforms to enrich the learning experience.<sup>28</sup> Integrating technology fosters active, student-centred strategies, contrasting sharply with traditional teaching that often emphasises rote memorisation.<sup>29</sup> In TVE, which seeks to prepare students with practical skills for the workforce, digital pedagogy is especially pertinent. It promotes using interactive activities like simulations, multimedia resources and useful projects, which are crucial for hands-on learning.<sup>30</sup>

Teachers must also consider diverse learning styles to ensure inclusivity and accessibility.<sup>31</sup> Incorporation of digital practices into DLPs leads to significant improvements in teacher training and student outcomes. Mhlongo et al. discovered that interactive content boosts student engagement, while project-based learning enhances critical thinking and collaboration.<sup>32</sup> Collaborative tools like discussion forums further enrich the educational experience.<sup>33</sup> A review conducted by Muyambi and Ramorola emphasises that teacher trainers (lecturers) who adopt digital pedagogy feel more equipped to tackle the complexities of the classroom.<sup>34</sup> The Universities in Namibia exemplify this approach through online workshops that improve teacher training and engagement with real-world content, increasing participant satisfaction.<sup>35</sup>

### METHODOLOGY

The study was grounded in an interpretivist paradigm, emphasising understanding participants' lived experiences and the meanings they attach to using DLPs in teacher training. This paradigm facilitates an in-depth exploration of subjective perspectives, aligning well with the study's aim to interpret how DLPs influence educational practices within the South African TVE context. A qualitative research approach was adopted to gain rich, detailed insights into participants' experiences, perceptions and attitudes regarding DLPs. This approach allows for an in-depth understanding of complex social phenomena, particularly how educators and students engage with digital tools in the learning and teaching process. The research employed a case study design, focusing on a single South African university's TVE program. This design enabled a

<sup>27</sup> Martha Hendrika Maritsa Grewe, "A Virtual Reality Learning Framework for Improving Student Engagement at a Selected Tertiary Institution, Cape Town, South Africa." (Cape Peninsula University of Technology, 2023).

<sup>28</sup> C Nanjundaswamy, S Baskaran, and M H Leela, "Digital Pedagogy for Sustainable Learning," *Shanlax International Journal of Education* 9, no. 3 (June 1, 2021): 179–85, <https://doi.org/10.34293/education.v9i3.3881>.

<sup>29</sup> Ni Wayan Pastini and Luh Nyoman Tri Lilasari, "Empowering EFL Students: A Review of Student-Centred Learning Effectiveness and Impact," *Journal of Applied Studies in Language* 7, no. 2 (December 31, 2023): 246–59, <https://doi.org/10.31940/jasl.v7i2.246-259>.

<sup>30</sup> Weiqiang Jia and Xiaocui Huang, "Digital Literacy and Vocational Education: Essential Skills for the Modern Workforce," *International Journal of Academic Research in Business and Social Sciences* 13, no. 5 (May 18, 2023), <https://doi.org/10.6007/IJARBS/v13-i5/17080>.

<sup>31</sup> Qiao Cui, and Weng Fwuyuan, "Adaptive Learning Strategies in Higher Vocational Education: Utilizing Concise Cases for Diverse Learning Styles," *International Journal of Instructional Cases* 8, no. 2 (2024): 18–37.

<sup>32</sup> Mhlongo et al., "Challenges, Opportunities, and Prospects of Adopting and Using Smart Digital Technologies in Learning Environments: An Iterative Review."

<sup>33</sup> Patient Rambe, "Spaces for Interactive Engagement or Technology for Differential Academic Participation? Google Groups for Collaborative Learning at a South African University," *Journal of Computing in Higher Education* 29, no. 2 (August 1, 2017): 353–87, <https://doi.org/10.1007/s12528-017-9141-5>.

<sup>34</sup> Godfrey Chitsauko Muyambi and Mmankoko Ziphorah Ramorola, "Unveiling Educators' Readiness to Teach through Digital Media (DM): The Case of South Africa," *Education and Information Technologies* 30, no. 10 (July 23, 2025): 13807–34, <https://doi.org/10.1007/s10639-024-13310-w>.

<sup>35</sup> E. T. Ithindi, "The Use of Moodle as an e-Learning Tool for English Language Teaching and Learning in Namibia" (The University of South Africa, 2019).

detailed exploration of the specific context, capturing the nuances of digital platform integration and its impact on teacher training within this setting.

The target population comprised 589 students enrolled at various levels of the TVE program and 14 lecturers involved in delivering TVE courses at the university. These groups represent diverse perspectives relevant to understanding the use and influence of DLPs in teacher training. Purposive sampling was used to select participants who could provide rich, relevant information aligned with the research objectives. From the student population, four students from each academic year (first, second, third) across different specialisations were purposefully chosen based on their active use of DLPs in their studies, totalling 12 students. Four of the lecturers were selected based on their expertise and experience in teaching general and specialised TVE courses. This sampling process ensured diversity in viewpoints and depth of insights into integrating digital platforms. The sample thus consisted of 12 students representing different academic years and specialisations, all of whom actively engaged with DLPs and four experienced lecturers involved in teaching with digital tools within the TVE curriculum.

Data collection was conducted through semi-structured interviews, allowing participants to elaborate on their experiences and perceptions.<sup>36</sup> Each interview lasted approximately 35 to 40 minutes and was conducted in a quiet, comfortable environment to foster openness. Before the interviews, participants received detailed information about the study's purpose and their rights, and written informed consent was obtained to ensure voluntary participation. The interviews were audio recorded with participants' permission to ensure accuracy, and all recordings were transcribed verbatim. To maintain confidentiality, all participants were assigned pseudonyms, with students labelled S1–S12 and lecturers L1–L4. Thematic analysis was employed to interpret the qualitative data, following Braun and Clarke's guidelines.<sup>37</sup> Transcripts were read multiple times to achieve thorough familiarisation with the content. Initial coding was carried out using an inductive approach, allowing themes to emerge from the data, complemented by deductive coding based on existing literature and research questions. Codes were then grouped into broader themes that encapsulated participants' experiences with DLPs in teacher training. These themes were refined iteratively to ensure they accurately represented the data and aligned with the study's objectives.

During the research process, careful attention was paid to ethical standards. Participants received detailed information regarding the objectives, methods, and their rights related to the study. Informed consent was obtained before participation, emphasising voluntary involvement and the right to withdraw without penalty. To protect confidentiality, all identifying information was anonymised using pseudonyms, and the information was securely stored in password-protected files that were only accessible to the research team. The study obtained ethical clearance from the relevant research review board, which reviewed and sanctioned the research protocol by established ethical standards.

## PRESENTATION OF FINDINGS AND DISCUSSIONS

This section presents the key insights gathered from participant responses regarding their perceptions, experiences, and challenges in using DLPs in TVE teacher training. The discussion highlights both the potential benefits and the infrastructural, technical and attitudinal barriers that influence the effectiveness of digital integration.

### Perceptions of DLPs in Teacher Training

One of the key questions posed to participants was: How has using Digital Learning Platforms (DLPs) influenced your teaching and learning experiences in TVE teacher training? The responses reflect a spectrum of perceptions ranging from enthusiasm and appreciation of the benefits to concerns about infrastructural and

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<sup>36</sup> Omolola A. Adeoye-Olatunde and Nicole L. Olenik, "Research and Scholarly Methods: Semi-structured Interviews," *JACCP: Journal of the American College of Clinical Pharmacy* 4, no. 10 (October 2, 2021): 1358–67, <https://doi.org/10.1002/jac5.1441>.

<sup>37</sup> Virginia Braun and Victoria Clarke, "Using Thematic Analysis in Psychology," *Qualitative Research in Psychology* 3, no. 2 (2006): 77–101.

technical challenges, highlighting the complex reality of integrating digital tools into educational settings. Many students expressed confidence about the integration of DLPs into their training. Participant S3 remarked,

*'Using the digital learning platforms made my learning more interactive; I could access resources anytime and revisit lectures at my own pace and time.'*

Similarly, S7 noted,

*'The collaboration features allowed me to work with my peers beyond class hours, which helped to improve my understanding of practical concepts.'*

However, some students highlighted challenges, such as technical issues and unfamiliarity with digital tools. S2 shared,

*'Sometimes the platform is slow because of network challenges, and I struggle to navigate certain features, which can be frustrating.'*

S5 noted that:

*'The digital environment is helpful, but sometimes I feel overwhelmed trying to keep up with all the new technology, especially since I do not have consistent internet at my residence.'*

The response from S8 was:

*'I think digital learning platforms are good, but I also believe face-to-face interaction is still necessary because some concepts are hard to grasp online.'*

The response from S10 was:

*'The platform's design isn't user-friendly for everyone; I sometimes find it confusing, which affects my learning.'*

Lecturers also acknowledged the benefits of DLPs in facilitating flexible and engaging teaching. L2 stated,  
*'The digital platforms have transformed how I deliver content; I can easily incorporate multimedia and real-world examples.'*

Nonetheless, they pointed out infrastructural challenges like unreliable internet and limited device access. L4 explained,

*'While I see the potential, many students still lack the necessary devices or stable internet connection to participate fully.'*

L1 noted:

*'In some areas, the poor internet connectivity makes conducting live sessions or interactive activities difficult.'*

L3 responded by saying that:

*'We need more training for both us as staff members and students to use these platforms in a way that is effective; otherwise, if we do not take action, we will not fully realise the benefits.'*

The response from S14 was:

*'Some students prefer traditional methods, so introducing digital learning platforms requires carefully balancing digital and face-to-face approaches. That's my take.'* L4.

The responses from most participants reflect a generally positive attitude towards DLPs, particularly regarding their flexibility and capacity to foster collaboration and resource accessibility.<sup>38</sup> However, infrastructural shortcomings, such as unreliable internet and limited device access, significantly hinder the full realisation of these benefits. These challenges are consistent with previous research highlighting that technological infrastructure and digital literacy are critical barriers to successful digital integration in South Africa's educational landscape.<sup>39</sup> Moreover, some participants' concerns about digital fatigue and the need for face-to-face interaction underscore that technology should complement, not replace, traditional pedagogies, especially in vocational contexts where hands-on skills are vital.

### **Impact of DLPs on Teaching and Learning Processes**

A key question posed to students and lecturers was: How have DLPs influenced your teaching and learning experiences in TVE? The responses reveal positive impacts and ongoing challenges, illustrating the complex realities of integrating digital tools into vocational education. Participants reported that DLPs enhanced their engagement and understanding of technical concepts. S4 shared,

*'The videos and simulations made difficult concepts easier to understand and apply in practical situations.'*

S9 added,

*'The online forums allowed me to discuss issues with classmates, which helped deepen my understanding.'*

S12, reflected,

*'Using digital learning platforms has made my lessons as a tutor more interactive; students are more involved and I can better assess their progress through online quizzes.'*

S5 noted,

*'The digital resources are invaluable, especially when revising topics quickly before exams.'*

S8 mentioned,

*'Sometimes, technical problems disrupt the learning flow, which can be frustrating and discouraging.'*

L2 observed,

*'The use of digital learning platforms has encouraged students to take more responsibility for their learning, which is a positive development in our training programs.'*

Some students expressed reservations about their readiness to transition fully to digital learning. S6 stated,

*'While I like the online resources, I need more support to use them effectively, especially when I encounter technical problems.'*

S10 added,

*'In some areas, especially where I reside, the internet is too slow or unreliable, which makes it hard to do online activities.'*

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<sup>38</sup> Bramhe and Pimple, "Optimizing Learning Environments."

<sup>39</sup> Stroebel, Hay, and Bloemhoff, "An Approach to Re-Skilling of In-Service Teachers in Physical Education in South African Schools."

S11 shared,

*'Some of my classmates do not have access to good devices at home, so they miss out on some of the benefits of digital learning platforms.'*

Lecturers observed that DLPs encouraged active participation. L1 stated,

*'Students are more motivated when they can access interactive content and participate in online discussions.'*

L3 added,

*'Many lecturers, including myself, still need to improve their skills in designing engaging digital content, which affects the learning experience.'*

L4 mentioned,

*'We need ongoing training to help us develop better digital teaching materials.'*

L2 pointed out,

*'Without proper infrastructure and training, the potential of digital learning platforms cannot be fully realised.'*

The responses underscore the significant potential of DLPs to foster more engaging and student-centred learning environments, consistent with constructivist principles.<sup>40</sup> The positive feedback on simulations and online forums demonstrates how interactive and collaborative tools can promote active participation and a more profound understanding in vocational training. However, the challenges raised, such as unreliable internet, limited access to devices and the need for ongoing professional development, highlight infrastructural and capacity gaps that must be addressed to realise the full benefits of DLPs.<sup>41</sup> These issues suggest that successful integration requires technological investment and continuous training and support for lecturers and students. The mixed responses reveal that digital tools should complement traditional teaching methods rather than replace them, especially where hands-on, practical skills are fundamental. As Mhlongo et al. and Gu emphasise, the effective use of DLPs depends on ongoing capacity-building initiatives that empower lecturers and students alike.<sup>42</sup> Without such comprehensive support, the transformative potential of digital platforms in South Africa's TVE curriculum may remain limited, underscoring the importance of a balanced, inclusive approach to digital integration.

### **Challenges in Implementing DLPs**

A common question posed to participants was: 'What are the main challenges you face in using Digital Learning Platforms for teacher training in TVE?' The responses reveal significant infrastructural and attitudinal barriers, alongside resistance to change, that hinder effective implementation of digital platforms. Many participants cited infrastructural limitations. S1 explained,

*'Our internet connection is very unstable, especially during peak hours, which disrupts my ability to participate fully.'*

S11 added,

*'Many of my classmates do not have smartphones or laptops, so they cannot access the platform outside school hours.'*

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<sup>40</sup> Vygotsky, *Mind in Society: The Development of Higher Psychological Processes*.

<sup>41</sup> Stroebel, Hay, and Bloemhoff, "An Approach to Re-Skilling of in-Service Teachers in Physical Education in South African Schools."

<sup>42</sup> Mhlongo et al., "Challenges, Opportunities, and Prospects of Adopting and Using Smart Digital Technologies in Learning Environments: An Iterative Review"; Gu, "Empowering Vocational Education through Digital Technology: Innovating the Teaching Landscape."

S13, a lecturer, shared,

*'The lack of proper devices and reliable internet hampers our efforts to integrate digital learning platforms into teaching fully.'*

S4 responded by saying that:

*'Even when I have access, the platform often crashes or loads slowly, which wastes time and frustrates me.'*

S8 further responded by saying that:

*'Some students, especially in rural areas, have no internet at all, making it impossible to participate outside of class, '*

S10 noted,

*'The school's limited budget means we don't have enough devices or high-speed internet to support large online classes.'*

Lecturers highlighted resource shortages. L2 stated,

*'We need better devices and internet access to fully use digital learning platforms, but the institution's budget is limited.'*

L4 said that:

*'Without proper infrastructure, we risk widening the digital divide, which contradicts the goal of inclusive education.'*

L1 noted:

*'Many students still prefer traditional classroom methods and some resist adopting new technologies.'*

The response from L3 was:

*'It is difficult to train staff and students on digital platforms when the basic infrastructure is lacking or unreliable.'*

The feedback from participants reveals significant infrastructural challenges that align with the findings of Stroebel et al. and Kovalchuk et al.<sup>43</sup> The digital divide continues to be a substantial barrier in South Africa, disproportionately impacting students in rural and underserved areas and hindering equitable access to quality vocational training. To overcome these challenges, targeted investments in internet infrastructure, affordable devices and digital literacy programs are essential. Resistance from participants, often from unfamiliarity or discomfort with technology, highlights the necessity of implementing change management strategies. Ajani and Dlomo indicate that fostering acceptance and confidence in digital tools is crucial for successful integration.<sup>44</sup> Addressing these infrastructural and attitudinal barriers is vital for unlocking the full potential of DLPs in transforming teacher training in TVE and promoting inclusive education.

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<sup>43</sup> Stroebel, Hay, and Bloemhoff, "An Approach to Re-Skilling of in-Service Teachers in Physical Education in South African Schools"; Kovalchuk et al., "Vocational Education in the Context of Modern Problems and Challenges."

<sup>44</sup> Ajani and Dlomo, "Comparative Analysis of Digital Transformation's Impact on Higher Education Institutions: A Systematic Literature Analysis of Public versus Private Sector."

## Enhancing the Effectiveness of DLPs in TVE

A common question posed to participants was: ‘What strategies or measures could be implemented to improve the effectiveness of DLPs in TVE teacher training?’ The responses highlight the need for infrastructural improvements, ongoing professional development and clear policy frameworks to support the successful integration of DLPs. Many participants emphasised the importance of infrastructural investment. S1 explained,

*‘Our internet connectivity needs to be upgraded, and we require more access to devices to ensure all students can participate effectively.’*

S11 added,

*‘Providing affordable tablets or laptops for students and staff would make a significant difference in access and engagement.’*

Participants also stressed the importance of continuous training. S4 remarked,

*‘Regular workshops and training sessions for lecturers and students on using digital platforms would help us maximise their benefits.’*

S8 suggested,

*‘Institutions should develop comprehensive digital literacy programs to build confidence and skills among all users.’*

Furthermore, participants highlighted the need for clear policies and support structures. S10 stated,

*‘Institutions should establish clear guidelines and support systems, like help desks and mentorship programs, to assist us in using digital learning platforms effectively.’*

S12 emphasised that collaboration among policymakers, lecturers and technology providers is essential for creating sustainable digital strategies that align with the specific needs of TVE. The responses suggest that addressing infrastructural gaps, investing in ongoing training and establishing supportive policies are critical steps toward enhancing the use of DLPs. These strategies are consistent with the findings of scholars like Gu and Mhlongo et al., who underscore that continuous capacity building and policy support are vital for successful digital transformation in vocational education.<sup>45</sup> Implementing these measures could significantly improve the quality, accessibility and sustainability of DLPs in TVE teacher training programs.

## RECOMMENDATIONS

A comprehensive approach is important to harness the full potential of DLPs in TVE teacher training. Firstly, investing in digital infrastructure is important. This includes upgrading internet connectivity, especially in rural and underserved areas and providing affordable, reliable devices to students and lecturers. Such infrastructural improvements will ensure equitable access and facilitate consistent engagement with digital platforms. Secondly, ongoing professional development should be prioritised. Regular training workshops, digital literacy programs, support systems and mentorship initiatives are necessary to build confidence and competence among lecturers and students. These initiatives will foster a culture of continuous learning and adaptation to emerging digital pedagogies.

Thirdly, policy frameworks should be established to guide the systematic integration of DLPs. Clear guidelines on digital content development, usage protocols and evaluation standards that promote consistency and sustainability. Collaboration among policymakers, educational institutions and technology

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<sup>45</sup> Gu, “Empowering Vocational Education through Digital Technology: Innovating the Teaching Landscape”; Mhlongo et al., “Challenges, Opportunities, and Prospects of Adopting and Using Smart Digital Technologies in Learning Environments: An Iterative Review.”

providers is needed to develop contextually relevant, sustainable digital strategies that align with South African national educational goals. Lastly, change management strategies should address resistance and promote positive attitudes towards digital transformation. By implementing these recommendations, South Africa can significantly advance its TVE curriculum, producing competent, digitally literate teachers equipped to deliver high-quality, industry-relevant education that meets the needs of a rapidly evolving economy.

## CONCLUSION

This study has illuminated the transformative potential of DLPs in enhancing teacher training within South Africa's TVE curriculum. Participants consistently recognised that DLPs facilitate more interactive, flexible and resource-rich learning environments, suitable for preparing technologically proficient teachers to meet contemporary workplace demands. The findings demonstrate that when effectively implemented, DLPs can improve teaching and learning quality, foster student engagement and promote professional development among teachers. The study also highlighted persistent infrastructural challenges, including unreliable internet access, limited device availability and a lack of comprehensive digital literacy, which continue to impede the full realisation of digital education's benefits. Resistance to change and the need for ongoing capacity-building further complicate implementation efforts. While DLPs hold considerable promise for revolutionising teacher training in South Africa's TVE, their success hinges on addressing systemic infrastructural and human resource barriers.

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