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Online Learning Environments in Higher Education: Nexus Between Self-Directed Learning and Learning Attainment in Students' Online Learning Engagement

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Abstract

The rapid expansion of online learning environments in higher education has transformed how students access and engage with educational content. This study explores the intricate relationship between self-directed learning and learning attainment within these digital contexts. By examining how students' self-directed learning behaviours influence their academic success online, this research sheds light on the pivotal role of self-regulation, autonomy, and engagement in contemporary higher education. This study investigates the theoretical foundations underpinning self-directed learning and its implications for students' online learning engagement through a systematic literature review. Drawing upon the situated expectancy-value theory, the research delves into the mediating factors that may impact the effectiveness of self-directed learning strategies. Furthermore, it explores how academics and institutions can support and foster self-directed learning on online platforms. The findings of this study reveal that self-directed learning plays a crucial role in students' online learning experiences, leading to higher learning attainment. Students who exhibit self-regulation, effective time management, and metacognitive skills in their online studies are more likely to succeed academically. Academics and institutions are encouraged to design online courses that promote self-directed learning by enhancing student autonomy, providing opportunities for reflection, and encouraging active student participation. In conclusion, this research contributes valuable insights into the nexus between self-directed learning and learning attainment in online learning environments in higher education. It highlights the importance of empowering students to take control of their learning journey, ultimately enhancing their academic achievements in digital educational settings.

Keywords: *Online Learning; Self-Directed Learning; Learning Goals; Challenges; Perceived Value*

Introduction

Since the COVID-19 pandemic, higher education institutions have prioritised online education. Student-centred learning is possible with online education (Dwivedi et al., 2019). However, higher

education students' online learning engagement could have improved during COVID-19 (Pengpai News, 2020). This means online learning results depend on students' self-directed learning (SDL) (Zheng et al., 2020). Online students must also know their learning goals to govern their learning (Zhu, 2021). Few studies have examined whether knowing learning goals affects student involvement. Students often wonder, "Why must I learn this?" (Schmidt et al., 2019), indicating that learning behaviours are driven by perceived subject utility (Dweck, 1986). The significance of goals for students' identities affects accomplishment or utility value (Eccles, 2009). This study used the Situated Expectancy-Value Theory to investigate the occurrence. Eccles and Wigfield (2020) updated the expectancy-value theory (EVT) with social cognition and sociocultural aspects to enlarge the value theory, renaming it SEVT. SEVT emphasises how situations and culture affect an individual's developing anticipation and value. COVID-19 is an epidemic sociocultural situation that allows all teaching-related activities to be done online. This instance suggests how online students can benefit from SDL-required online learning (Beach, 2017; LaTour & Noel, 2021). Additionally, students' anticipation and value views regarding contextual learning types affect their effort and involvement in those contexts (Wigfield et al., 2009).

As COVID-19 has forced students to learn online, this study examines how their learning values and goals may affect their learning engagement. Several domain-specific, cross-sectional studies have demonstrated that perceived task value and related expectancy of success positively correlate and interact with students' achievement and academic choices. Online learning has garnered attention from researchers and practitioners, particularly in higher education (Hill et al., 2003; Hofmann, 2002). Many studies have examined the pros and cons of online learning, including its ease (Poole, 2000) and flexibility (Chizmar & Walbert, 1999) and its drawbacks, such as technological issues, loss of community, and delayed communication. However, student qualities and how they affect online learning are essential. Some researchers have examined prior knowledge (Mason & Weller, 2000), time management (Hill, 2002), and gender disparities (Rovai, 2002). Online learning scholars focus on self-directed learning, or the ability to guide and direct oneself (Hartley & Bendixen, 2001). The research on self-direction has focused on process (Mocker & Spear, 1982) and personal traits (Garrison, 1997). SDL research has concentrated on two primary areas: adult verification and model descriptions (Brookfield, 1984; Brockett, 2002; Merriam, 2001).

SDL experts note that students' self-direction may vary depending on the learning context (Candy, 1991). Candy (1991) states that students may be self-directed in familiar or similar topics. A Spanish-speaking student may be self-directed when learning Italian, and a rugby player maybe when learning football. More research is needed to understand how SDL works in specific settings. Online environments are interesting for SDL research. Due to its predicted and reported impact on online learning in higher education (Sloan Consortium, 2004), SDL has gained attention. Online learning research suggests that SDL skills may help students (Hartley & Bendixen, 2001). Inclusion in higher education requires digital accessibility to give all students, including those with impairments, equitable access to educational materials and opportunities. In the fast-changing African educational scene, where technology is increasingly integrated, digital accessibility and its impact on inclusive higher education must be assessed. This introduction chapter discusses digital accessibility in Africa and the goals of a systematic evaluation to assess its implementation. African universities are integrating digital technologies into teaching, administration, and learning. Digital platforms, online materials, and virtual learning environments increase education access, flexibility, and interactivity. Realising technology's full potential for inclusive education requires making digital tools accessible to all students, including those with disabilities.

Designing and implementing digital materials and technology that people of all abilities can use is called digital accessibility. Compatible file formats, accessible websites, inclusive learning management systems, and helpful assistive technology are included. Upholding digital accessibility allows students with disabilities to participate in educational activities actively, interact with learning resources, and

interact with classmates and instructors. Despite the increasing recognition of digital accessibility in higher education, African obstacles and opportunities require additional consideration. Little resources, infrastructure, different languages and cultures, and awareness and experience make digital accessibility in Africa difficult. Policies and practises connected to digital accessibility vary across countries and institutions, emphasising the need for a comprehensive evaluation to understand the current situation and identify areas for improvement.

The main goal of this systematic review is to examine African higher education's digital accessibility and inclusive practices. This study examines African higher education's digital accessibility policies, practises, and issues through a comprehensive literature review. Digital accessibility includes assistive technology, internet accessibility, learning material digitisation, and student support services. The study will also examine student, instructor, and staff digital accessibility views. This rigorous review will shed light on digital accessibility in Africa, guiding inclusive higher education efforts. The evaluation aims to identify best practices, gaps, and areas for improvement to help create evidence-based policies, interventions, and capacity-building activities. Digital technology in African higher education must be accessible and inclusive to ensure equal educational opportunities for all students, regardless of ability. In Africa, inclusive higher education for all students, including those with disabilities, requires digital accessibility. As technology becomes more interwoven into education, digital accessibility and accessible higher education in Africa must be assessed. This systematic literature review analyses research on digital accessibility in African higher education institutions to promote inclusivity and address problems. The following research objectives guided the systematic review of the literature for this study:

a. To discover and analyse African higher education digital accessibility literature.

b. To evaluate African digital accessibility and inclusive higher education policies, practises, and projects.

c. To evaluate how digital accessibility affects African higher education students with impairments.

d. To identify African higher education's digital accessibility concerns and investigate solutions.

Theoretical Framework

This study adopts situated expectancy-value theory as its theoretical framework to underpin self-directed learning in the online learning environment in higher education. The Expectancy-Value Theory is a valuable framework for understanding how students perceive themselves, their capabilities, and others. Extensive research has demonstrated that the educational context plays a pivotal role in shaping students' academic choices, goals, and ultimate success (Rosenzweig et al., 2019). While there have been studies applying the EVT to motivate teaching and learning (Jones et al., 2010; Perez et al., 2019), there needs to be more investigation of this theory within the realm of online learning engagements for students' achievements. Students' online learning engagements in higher education. Self-directed learning on the part of students is a crucial factor influencing online learning engagements (Lo, 2019). According to Shang et al. (2023), students take responsibility for what, how, and when they access online learning, as influenced by the motivation for why they need to learn or attain educational achievements. Their perception of learning is a significant factor in teaching and learning within higher education (Ball et al., 2016). Pursuing meaningful and valuable online engagements through self-directed approaches motivates them to dedicate considerable time and effort to enhance their academic performance (Rachmatullah et al., 2021).

In the context of online learning in higher education, learning holds a distinct and privileged status, according to students' perceptions. It is critical in achieving educational excellence, fostering achievements and participation, and using and advancing technology (Ball et al., 2019). The Situated

Expectancy-Value Theory (EVT) offers a valuable framework for understanding the dynamics of self-directed learning in online learning environments. This theory, which combines social cognitive theory and expectancy-value theory, emphasises the role of individual beliefs, values, and contextual factors in shaping learning behaviour and outcomes (Eccles & Wigfield, 2020). When applied to self-directed learning in online settings, it provides insights into how students' expectations and perceived values influence their engagement and success (Soliman, 2020; Tang et al., 2022).

According to Ranellucci et al. (2020), the situated expectancy-value theory offers a valuable framework for understanding the dynamics of self-directed learning in online learning environments within higher education. This theory posits that students' expectations and the perceived value of learning goals are situated within specific contexts, influencing their motivation, engagement, and learning outcomes (Hirt et al., 2022). Many academics have established several crucial insights when applied to self-directed learning in online higher education (Farrel et al., 2016; Beymer et al., 2022; Eccles & Wigfield, 2023). Heyward-Rotimi (2023) asserts that the theory provides contextual relevance in the education system. The situated expectancy-value theory underscores the importance of considering the unique context of online learning environments. In higher education, online courses vary widely in content, instructional methods, and technological tools. Students' expectations and the perceived value of self-directed learning can differ significantly based on these contextual factors (Eccles & Wigfield, 2023). Farrell et al. (2016) posit that the theory promotes student expectations and beliefs. Within the framework of this theory, students' expectancy beliefs come to the forefront (Jones et al., 2010; Perez et al., 2019). In online learning, students may have varying levels of confidence in their ability to self-direct their learning. Some may possess strong self-efficacy beliefs and feel well-prepared to navigate online courses independently, while others may lack confidence and require additional support (Atkinson, 1957; Soliman, 2020).

According to Perez et al. (2019), the situated expectancy-value theory encourages students' value beliefs in their engagement in online learning environments. Thus, Heyward-Rotimi (2023) posits that the perceived value of self-directed learning goals is another critical aspect of this theory. Students' motivation to engage in self-directed learning within online environments hinges on how they perceive the relevance and importance of the knowledge and skills they acquire (Eccles & Wigfield, 2020). Ball et al. (2020) opine that students' motivation increases when they see a direct connection between their self-directed efforts and their academic or career goals. In addition, Beymer et al. (2022) agree that contextual support is attained through situated expectancy-value theory in students' online engagements. Educational institutions play a crucial role in shaping the context for self-directed learning in online higher education. According to Woldegiorgis (2020), educational institutions can provide resources, guidance, and instructional design strategies that promote self-directed learning. Thus creating for academics the opportunities for reflection, autonomy, and active learning within the online courses they design (Eccles & Wigfield. 2023). However, Farrell et al. (2016) argue that the theory has mediating factors. According to Konyana (2023), the situated expectancy-value theory acknowledges that various factors can mediate the relationship between expectancy and value beliefs and self-directed learning outcomes. These factors may include the design of the online course, the quality of instructional materials, the level of interaction and collaboration, and the presence of feedback mechanisms (Landa et al., 2021; Laufer et al., 2021; Nel et al., 2023). The situated expectancy-value theory offers a lens to examine the interplay between students' expectations, perceived value, and self-directed learning behaviours in online learning environments within higher education (Ajani & Maphalala, 2023). By considering the unique context and mediating factors, academics and institutions can better understand and facilitate self-directed learning, ultimately enhancing students' engagement and success in online courses, Raff et al., 2022).

Beymer et al. (2022) posit that the situated expectancy-value theory (SEVT) has gained attention in education, particularly in online learning environments in higher education. SEVT emphasises the importance of situations in influencing individuals' motivational beliefs and academic choices (Eccles &

Wigfield, 2023). It builds upon the traditional expectancy-value theory (EVT) and considers the specific context in which learning occurs (Tang et al., 2022). SEVT posits that students' expectations for success and subjective task values (STVs) are situation-specific and can vary across learning situations (Tang et al., 2022). This theory recognises that students' motivational beliefs and engagement can be influenced by the specific characteristics of the learning environment, such as the design of online learning platforms and the availability of resources (Beymer et al., 2022). In the context of self-directed learning in online learning environments, SEVT provides a framework for understanding how students' expectancies and task values can impact their engagement and learning outcomes (Hirt et al., 2022). Self-directed learning refers to the ability of students to take control of their learning process, making decisions about what, how, and when to learn (Oke et al., 2020). It is associated with student autonomy, time management, organisation, self-regulation, metacognition, and learning engagement. SEVT suggests that students' expectancies for success and task values can influence their motivation to engage in self-directed learning (Farrell et al., 2016). For example, if students perceive high value in the learning goals and strongly believe in their ability to succeed, they are more likely to engage in self-directed learning behaviours.

On the other hand, if students have low expectancies and perceive low value in the learning goals, they may be less motivated to engage in self-directed learning (Ranellucci et al., 2022). Thus, to support self-directed learning in online learning environments, it is crucial to consider the situational factors influencing students' expectations and task values (Beymer et al., 2022). This includes providing appropriate learning resources and designing online content that encourages active participation, reflection, and metacognitive activities. Additionally, motivation plays a crucial role in fostering self-directed learning, and academics can support and encourage students to promote their engagement in self-directed learning approaches (Shang et al., 2023). In summary, the situated expectancy-value theory (SEVT) provides a framework for understanding the role of expectancies and task values in self-directed learning in online learning environments. SEVT emphasises the importance of situational factors in influencing students' motivational beliefs and engagement. To support self-directed learning, it is crucial to provide appropriate learning resources, design engaging online content, and foster motivation among students. By considering the principles of SEVT, academics and institutions can create an environment that promotes self-directed learning and enhances students' learning outcomes in online higher education settings.

Justification for the Situated Expectancy-Value Theory (SEVT)

The choice to employ the "situated expectancy-value theory" in this study is well-founded. It provides a strong theoretical framework for investigating digital accessibility and self-directed learning in online higher education environments, particularly in Africa (Perez et al., 2019). The theory is well-suited for a study focused on the African context, where unique cultural, linguistic, and infrastructural factors shape the landscape of higher education (Hirt et al., 2022). By emphasising the importance of considering context, the theory allows for a nuanced analysis of how digital accessibility and self-directed learning practices are situated within Africa's educational environment. The "expectancy" aspect of the theory aligns with the motivation behind self-directed learning (Loh, 2019). In online education, it is crucial to understand how students perceive the likelihood of achieving their learning goals (expectancy) and the value they attach to those goals (Jones et al., 2010; Eccles & Wigfield, 2020). This aids in exploring how students' perceptions of the digital learning environment may affect their motivation to engage in self-directed learning. The theory emphasises the perceived value of learning goals. Inclusive higher education aims to provide equitable opportunities for all students, including those with disabilities. By evaluating how students perceive the value of accessible digital learning resources, the theory can shed light on whether digital accessibility positively impacts their motivation to engage in self-directed learning.

The theory acknowledges that various factors can mediate the relationship between expectancy-value beliefs and actual outcomes (Ball et al., 2016; Rachmatullah et al., 2021). In digital accessibility and self-directed learning, these mediating factors include institutional policies, technological

infrastructure, faculty support, and student awareness (Ajani, 2023). The theory's framework allows for a comprehensive exploration of these factors. As the study aims to assess the impact of digital accessibility and self-directed learning in the African higher education landscape, the theory's focus on understanding policies and practices aligns with the research goals (Gamede et al., 2022). It helps identify how policies and practices related to digital accessibility and self-directed learning can be improved to enhance inclusive education. The theory offers a holistic perspective by considering both the expectancy and value aspects. This allows for a more comprehensive understanding of the complex relationship between digital accessibility, self-directed learning, and inclusive higher education (Ajani & Khumalo, 2023). Hence, the "situated expectancy-value theory" provides a robust theoretical foundation for investigating digital accessibility and self-directed learning in the African higher education context (Mhlanga & Moloi, 2021). Its emphasis on contextual, motivational, and mediating factors aligns well with the study's objectives. It offers valuable insights into enhancing inclusive education through digital accessibility and self-directed learning practices.

Digital Accessibility in African Higher Education Institutions

The extant body of scholarly work pertaining to digital accessibility within African higher education institutions elucidates various prominent themes and obstacles. A prevalent observation suggests that the integration of digital technology has not yet resulted in a substantial transformation of the pedagogical practices and learning experiences in higher education (Oke & Fernandes, 2020). Despite the promising potential of technology in augmenting pedagogy and knowledge acquisition, African educational institutions continue to face substantial obstacles in achieving digital inclusivity (Woldegiorgis, 2022). The difficulties mentioned above have been further compounded by the COVID-19 epidemic, resulting in an intensified disparity in digital access between pupils from rich and underprivileged households (Woldegiorgis, 2022). The concept of the digital divide pertains to the disparity in access to and utilisation of digital technology, with a special focus on marginalised populations (Woldegiorgis, 2022). Students hailing from socioeconomically disadvantaged households frequently encounter obstacles, including restricted availability of suitable technological resources and inadequate internet connectivity (Woldegiorgis, 2022). The provision of access is crucial in order to facilitate the complete engagement of individuals in online learning endeavours, while potentially reinforcing preexisting disparities within the realm of higher education (Woldegiorgis, 2022).

Moreover, scholarly literature underscores the importance of adopting a social justice framework in order to tackle the issue of the digital divide and guarantee fair and equal access to educational resources and infrastructure (Tang et al., 2022; Woldegiorgis, 2022; Eccles & Wigfield, 2023). The examination of the digital divide's ramifications on access, equity, management, efficiency, pedagogy, and the quality of online teaching and learning is of utmost importance (Woldegiorgis, 2022). The urgent need to incorporate digital technology into African universities is widely recognised as a crucial endeavour aimed at reducing disparities and ensuring equitable access to educational opportunities for all students (Mhlanga & Moloi, 2020; Laufer et al., 2021; Woldegiorgis, 2022; Mpungose, 2023). The scholarly literature also emphasises the significance of tackling neocolonial digital constraints that have an influence on e-libraries and African scholarship (Heyward-Rotimi, 2023). The availability of digitised scholarly databases and the difficulties faced by African scholars in navigating platforms that are predominantly Western-centric have been highlighted in previous research (Farrell et al., 2016; Kern, 2022; Eccle & Wigfield, 2023; Heyward-Rotimi, 2023). The aforementioned limitation hinders individuals' capacity to engage with and make valuable contributions to the worldwide pool of knowledge (Ajani & Khumalo, 2023).

The extant body of research pertaining to digital accessibility within African higher education institutions highlights the imperative of mitigating the digital divide and fostering equitable access to digital technologies. Ajani (2023) emphasises the difficulties faced by pupils from impoverished backgrounds and underscores the significance of incorporating digital technology into educational

methodologies. Furthermore, a number of scholarly investigations underscore the imperative of tackling neocolonial digital obstacles and advancing African scholarship within the worldwide domain of knowledge (Mhlanga & Moloi, 2020; Mosito et al., 2020; Maphalala et al., 2021; Afolabi & Ajani, 2023). African higher education institutions have the potential to improve digital accessibility and provide equitable opportunities for all students by effectively addressing these concerns.

The issue of digital accessibility in higher education institutions in South Africa has gained significant importance, especially in the context of the COVID-19 pandemic and the subsequent transition to online modes of teaching and learning (Gamede et al., 2022; Ajani, 2023; Maphalala & Ajani, 2023). The extant body of literature elucidates the obstacles and ramifications associated with digital accessibility within higher education institutions in South Africa (Dube, 2020; Mhlanga & Moloi, 2020; Gamede & Ajani, 2022; Nel et al., 2023). Mhlanga and Moloi (2020) contend that the COVID-19 pandemic exerted a substantial impact on and served as a catalyst for digital transformation within the South African higher education landscape. The research emphasises the impact of the pandemic and subsequent lockdown on the transition to remote (online) learning, revealing preexisting obstacles and disparities in accessing digital resources and educational platforms. Hence, the authors underscore the importance of evaluating the achievements and shortcomings of implemented technologies, as well as the expenses involved in expanding the utilisation of these technologies. Consequently, numerous institutions of higher education have embraced and enhanced their students' utilisation of educational technologies.

According to Woldegiorgis (2022), the digital divide within the South African higher education system has become increasingly evident among rural students and universities, particularly in light of the COVID-19 epidemic. This study underscores the manner in which online instruction and learning have exacerbated preexisting disparities by intensifying the digital divide among students from privileged and underprivileged backgrounds. The author concurred that adopting a social justice strategy is crucial in addressing the digital divide and guaranteeing equitable access to educational infrastructure.

The study conducted by Landa et al. (2021) investigates the effects of the COVID-19 pandemic on the educational sector in South Africa, encompassing higher education as well. The findings of the study indicate that students hailing from economically disadvantaged rural communities require assistance in accessing online educational platforms and resources. The authors emphasise the significant disparities in educational achievements among students from varying socioeconomic origins as a crucial issue, and discuss the ramifications of these disparities for institutions of higher education. The COVID-19 epidemic, according to Chisita and Chizoma (2021), made it necessary to reevaluate academic library space in South Africa. This study underscores the significance of digital libraries during periods of crisis and underscores the digitalization of the education sector, particularly in higher education. The authors underscore the necessity of proactively preparing for the future by modifying library premises to facilitate digital access and accommodate digital materials. In their study, Cox et al. (2022) examine the difficulties associated with obtaining cost-effective and suitable instructional resources within the context of higher education in South Africa. The study underlines the necessity for access to textbooks and other educational resources that can be legitimately shared online. The authors underline the need for curriculum transformation and social justice in higher education, especially addressing concerns of access and affordability. Overall, the extant literature on digital accessibility in South African higher education institutions underscores the challenges created by the digital divide, the need for social justice methods, and the relevance of addressing access, affordability, and infrastructural issues. The importance of digital transformation in higher education and the imperative to enable equitable access to digital resources and platforms for all students have been further underscored by the COVID-19 epidemic (Mhlanga & Moloi, 2020).

Policies, Practices and Initiatives to Promote Digital Accessibility and Inclusive Higher Education in South Africa

Online learning environments are significant for learning in higher education (RSA, 1997; Higher Education Act, 1997). Various online learning platforms require self-directed learning by the students towards their learning achievements (Woldegiorgis, 2022). Promoting digital accessibility and inclusive higher education in South Africa involves a combination of policies, practices, and initiatives to ensure equitable access to educational resources and opportunities for all students, including those with disabilities. Thus, the South African national government has initiated various actions to promote inclusive digital accessibility at various higher education institutions (RSA, 2013; Bawa, 2016; Ngubane-Mokiwa & Palmer, 2017; Chisita & Chioma, 2021), some of which include policies, practices, and initiatives:

National Policies:

National Integrated ICT Policy White Paper: South Africa's National Integrated ICT Policy White Paper (1997) outlines the government's commitment to digital inclusion and accessibility. It includes provisions for making digital services, including educational resources, accessible to all citizens, including those with disabilities. This policy defines what, how, and why stakeholders should take action to promote ICT inclusivity in higher education. The 4IR has framed every sector of humankind, and education is no exception. According to Maphalala et al. (2021), the introduction of ICT into higher education has influenced approaches to teaching and learning. At the same time, Ajani (2023) asserts that ICT in education has improved learning outcomes in higher education.

Higher Education Act (No. 101 of 1997): This legislation governs higher education in South Africa. It includes provisions related to equity and access, ensuring that higher education institutions work towards inclusive practices. This policy regulates the affairs of higher education institutions across the country. According to various studies, the act promotes the advancement of education through equal access to education for all willing citizens.

White Paper for Post-School Education and Training: This policy document focuses on post-school education and training in South Africa, including higher education. It emphasises access for all and the importance of addressing barriers to participation. The White Paper for Post-School Education and Training in South Africa focuses on post-school education and training, including higher education, emphasising access for all and addressing barriers to participation (Mhlanga & Moloi, 2020). The document recognises the importance of digital transformation in the education sector and the need to assess the successes and failures of deployed technologies (Mhlanga & Moloi, 2020). It acknowledges the challenges of limited access to education, particularly at the higher education level, and the need to scale technologies to ensure equitable access (Mhlanga & Moloi, 2020).

South African Sign Language Act (No. 17 of 2011): This legislation recognises South African Sign Language as an official language and promotes its use in various contexts, including education.

Practices:

Universal Design for Learning (UDL): Many South African higher education institutions adopt UDL principles. This involves designing courses and educational materials in ways that are accessible to a diverse range of students, including those with disabilities (Dookie, 2017).

Accessible Digital Content: Institutions are encouraged to create and provide accessible digital content. This includes ensuring that online learning platforms, videos, documents, and websites are designed with accessibility in mind (Thwala & Scott, 2014).

Inclusive Pedagogy: Faculty members are encouraged to adopt inclusive pedagogical practices. This involves teaching methods that accommodate various learning styles and abilities (Keengwe & Onchwari, 2009).

Professional Development: Institutions often provide training and professional development opportunities for faculty and staff on digital accessibility and inclusive education (Bawa, 2016).

Initiatives:

National Accessibility Portal: The South African government has launched initiatives such as the National Accessibility Portal, which provides information and resources related to accessibility and inclusion, including in the education sector (RSA, 2013).

Centre for Universal Access and Disability Support (CUADS): Many higher education institutions have established centres or offices, like CUADS, to provide support and accommodations for students with disabilities, ensuring they have equal access to educational opportunities (RSA, 2011).

South African Higher Education Learning and Teaching Association (SAHELTA): Organisations like SAHELTA work to advance teaching and learning practices in higher education, focusing on inclusivity and accessibility (Bawa, 2016).

Research and Data Collection: Initiatives often include research projects and data collection efforts to understand better the needs and experiences of students with disabilities in higher education, helping to inform policy and practice (Keengwe & Onchwari, 2009).

Collaboration: Collaboration among higher education institutions, government agencies, advocacy organisations, and international partners is standard (Bawa, 2016; Ngubane-Mokiwa & Palmer, 2017). These collaborations help share best practices and resources to promote digital accessibility and inclusive education.

Student Involvement: Including students with disabilities in the planning and implementing accessibility initiatives is considered good practice. This ensures that these students' voices and needs are considered (Keengwe & Onchwari, 2009).

In an attempt to promote digital accessibility and inclusive higher education in South Africa, several policies, practices, and initiatives have been implemented (Keengwe & Onchwari, 2009; RSA, 2011; 2013; Thwala & Scott, 2014; Bawa, 2016; Johnson & Louw, 2017; Maphalala et al., 2021). The COVID-19 pandemic has accelerated the digital transformation of education in South Africa, leading to the deployment of various Fourth Industrial Revolution (4IR) tools in primary, higher, and tertiary education (Dube, 2020; Mhlanga & Moloi, 2020; Ajani & Khumalo, 2023). This transformation aims to enhance access to education and improve learning outcomes.

South Africa has implemented policies to promote inclusive education, ensuring that students with disabilities and other marginalised groups have equal access to education (Mosito et al., 2020). These policies aim to create an inclusive education system that caters to the diverse needs of all students. In addition, efforts have been made to train teachers in inclusive education practices to support diverse students in the classroom (Mosito et al., 2020). Teacher education programs now include the infusion of inclusion to equip academics with the knowledge and skills to create inclusive learning environments. These initiatives have been undertaken to mitigate the digital divide and ensure equitable access to digital resources and platforms for all students (Woldegiorgis, 2022). Some of the adopted initiatives include providing devices, internet connectivity, and digital learning materials to students from disadvantaged backgrounds.

The higher education sector has focused on developing research skills to meet the development agenda of South Africa (Konyana, 2023). Efforts have been made to attract suitable students to research master's and doctoral programmes through recruitment initiatives and internal systems (Konyana, 2023). Efforts have been made to preserve and promote Indigenous knowledge systems through digital preservation policies and plans. This ensures the recognition and inclusion of diverse knowledge systems in higher education. Thus, policies and legislation, such as the Draft National Data and Cloud Policy, have been developed to align data protection practices with the Protection of Personal Information Act (PoPI Act) in South Africa (Raaff et al., 2022). These policies aim to safeguard data and ensure privacy in the digital era. These efforts address inequalities in access to online teaching and learning platforms and resources, particularly for students from poor rural communities (Landa et al., 2021). This includes providing support and resources to bridge the digital divide and ensure equal educational opportunities. These policies, practices, and initiatives promote digital accessibility and inclusive higher education in South Africa. They aim to address barriers to participation, ensure equitable access to education, and create inclusive learning environments that cater to the diverse needs of all students.

Hence, South Africa has made significant strides in promoting digital accessibility and inclusive higher education through policies, practices, and initiatives. These efforts aim to create a more equitable and accessible educational environment for all students, regardless of their abilities or backgrounds. Furthermore, promoting digital accessibility and inclusive higher education in South Africa requires implementing policies, practices, and initiatives that address the challenges and barriers faced by students with disabilities and other marginalised groups. Various studies have provided insights into the efforts and strategies employed in South Africa to promote digital accessibility and inclusive higher education ( ). Mhlanga and Moloi (2020) discuss the influence of the COVID-19 pandemic on motivating digital transformation in the education sector in South Africa. The study highlights the need to assess the successes and failures of deployed technologies and the associated costs of scaling these technologies. The authors emphasise the importance of digital transformation in addressing the challenges of limited access to education, particularly at the higher education level. Nel et al. (2023) explore the perceptions of lecturers and final-year students about the infusion of inclusion in initial teacher education programmes in South Africa. The study emphasises the role of teachers in implementing an inclusive education system and the importance of training academics to become more inclusive in their teaching practices. The authors discuss translating policies into practice and the need for a massive effort to ensure inclusive education. Kern (2022) examines the implementation of inclusive education in South Africa using a combined bio-ecological and capability perspective. The study highlights the challenges faced in implementing inclusion and the need for comprehensive strategies to address inequalities in education systems. The study emphasises the importance of understanding the contextual factors influencing inclusive education practices.

Balogun and Kalusopa (2021) focus on the digital preservation of Indigenous Knowledge Systems (IKS) in South Africa. The study assesses digital preservation policies and plans in selected repositories. It proposes a framework for the preservation of IKS, and this is to emphasise the importance of preserving and promoting Indigenous knowledge in the digital era. In another study, Woldegiorgis (2022) discusses strategies to mitigate the digital divide in the South African higher education system, particularly during the COVID-19 pandemic. His study emphasises the need for comprehensive and inclusive digital learning strategies and substantial government and educational institution coordination.

Furthermore, Mdikana (2021), in a study on the attitudes of deaf academics towards inclusive education in the Gauteng Province of South Africa, highlights the progress made in providing training for teachers in inclusive education. However, he emphasises the need for further efforts to promote inclusive schools and convert ordinary schools into full-service schools. Thus, various studies provide insights into the policies, practices, and initiatives implemented in South Africa to promote digital accessibility and inclusive higher education. They highlight the importance of assessing the impact of digital

transformation, translating policies into practice, training academics, addressing the digital divide, preserving Indigenous knowledge, and promoting inclusive attitudes and practices among academics. These efforts contribute to creating a more inclusive and accessible higher education system and thus remarkably impact South African higher education. The impacts are further highlighted (Johnson & Louw, 2017).

Impact of Digital Accessibility on Educational Experiences and Outcomes for Students

The impact of digital accessibility on the educational experiences and outcomes for students, including those with disabilities, is significant and far-reaching. The design and implementation of digital content, platforms, and technologies that are usable and understandable by people with a wide range of abilities is known as digital accessibility. Digital accessibility influences students' educational experiences and outcomes in various ways. According to Johnson and Louw (2017), digital accessibility ensures that all students have equal access to educational materials and resources regardless of their abilities. This includes digital textbooks, online course content, multimedia presentations, and learning management systems. When materials are accessible, students can engage with the same content as their peers, promoting a more inclusive learning environment. West et al. (2019) posit that accessible materials and technologies enhance students' engagement with course content. For example, closed video captions benefit students with hearing impairments and those who prefer to learn through reading. Thus, accessible content accommodates diverse learning preferences and styles, making learning more engaging and effective (Walto, 2018).

In addition, digital accessibility enables students with disabilities to actively participate in online discussions, collaborative projects, and virtual classrooms (Balogun & Kalusopa, 2021). It promotes a sense of belonging and ensures no student is excluded from interactive learning experiences. Chisita and Chizoma (2021) assert that accessible technologies empower students with disabilities to work independently. They further maintain that screen readers enable blind students to access digital texts without assistance, fostering self-reliance and autonomy in their learning journeys. Eccle and Wigfield (2023) assert that this improves student retention and comprehension. Thus, when digital materials are designed with accessibility in mind, they are often more structured and organised (Bawa, 2016). This can aid all students in comprehending and retaining information.

For instance, clear headings and well-organised content benefit students with cognitive disabilities. Accessible digital technologies often allow for customisation (Dookie, 2017). Students can adjust settings, such as font sizes or screen contrast, to meet their needs. This personalisation enhances the learning experience for all students. Various studies have shown that when students have access to accessible materials and technologies, their academic performance improves (Keengwe & Onchwari, 2009; Thwala & Scott, 2014; Bawa, 2016; Maphalala et al., 2021). They can more effectively study, complete assignments, and participate in assessments. Bawa (2016) posits that accessible technologies can reduce the stigma associated with disability. When students know they have equal access to materials and tools, they are less likely to experience stress related to their disabilities. Tang et al. (2022) believe inclusive digital accessibility will prepare all students for the workforce. In an increasingly digital and remote work environment, students with disabilities who are familiar with accessible technologies and online learning platforms are better prepared for the workforce. They can more easily access digital tools and participate in online job-related activities. Thwala and Scott (2014) opine that ensuring digital accessibility also helps educational institutions comply with legal requirements, such as the Americans with Disabilities Act (ADA) in the United States or similar legislation in other countries. Non-compliance can result in legal challenges and financial penalties.

Conversely, digital accessibility is pivotal in shaping students' educational experiences and outcomes. It not only removes barriers for students with disabilities but also enhances the learning environment for all, fostering a more inclusive and equitable educational system. By investing in digital

accessibility, educational institutions can positively impact students' academic success and prepare them for a more accessible and inclusive society (Bawa, 2016). The impact of digital accessibility on the educational experiences and outcomes for students has been a topic of interest, particularly in the context of the COVID-19 pandemic and the shift to remote learning (Gamede et al., 2022; Afolabi & Ajani, 2023). Various scholars shed light on the relationship between digital accessibility and students' remote learning proficiency, as well as the challenges and opportunities associated with digital education (Walton, 2018; Beymer et al., 2022; Cox et al., 2022; Tang et al., 2022). Katz et al. (2021) surveyed U.S. undergraduates to examine the impact of digital inequality on remote learning experiences during the COVID-19 pandemic. The study found that students' prior experiences with online coursework and digital inequality challenges were associated with their remote learning proficiency (Katz et al., 2021). The availability of consistent, high-speed internet connectivity, functioning devices, and the ability to communicate easily with professors and teaching assistants were critical factors for effective remote learning (Katz et al., 2021). Internet connectivity and digital device challenges were associated with lower remote learning proficiency (Katz et al., 2021).

Laufer et al. (2021) explored the experiences of higher education leaders in the rapid digital turn and the outcomes associated with digital education. They highlighted the multiple factors that contribute to an institution's ability to realise the potential of digital education, including access, learning, and collaboration. It also emphasises the deeply rooted individual, institutional, and system inequalities (Laufer et al., 2021). The digital divide and digital skills were important considerations in achieving positive learning outcomes in digital settings (Laufer et al., 2021). Thus, various studies suggest that digital accessibility is crucial to students' educational experiences and outcomes, particularly in remote learning (Bawa, 2016; Farrell et al., 2016; Soliman, 2020; Tang et al., 2022). Access to reliable internet connectivity, functioning devices, and effective communication with professors and teaching assistants are essential for successful remote learning (Katz et al., 2021). However, challenges related to digital inequality, such as limited access to internet connectivity and devices, can hinder students' remote learning proficiency (Katz et al., 2021). Addressing these challenges and promoting digital accessibility is essential for ensuring equitable educational opportunities and positive student learning outcomes.

Challenges and Barriers to Achievement of Digital Accessibility in African Higher Education

Achieving digital accessibility in African higher education is a complex endeavour fraught with numerous challenges and barriers. These obstacles can impede an inclusive educational experience for all students, including those with disabilities. Digital accessibility in Africa faces many challenges, especially for students to attain self-directed learning for educational achievements. Africa faces significant challenges related to limited internet access and unreliable connectivity (Thwala & Scott, 2014). Insufficient technological infrastructure and technical support in African higher education institutions can hinder digital accessibility (Chirinda et al., 2021). Limited bandwidth, power outages, and inadequate IT support can hinder the smooth functioning of digital learning platforms and impede students' access to online resources. Many regions need more broadband infrastructure, hindering access to online resources and remote learning (West et al., 2019).

Higher education institutions in Africa often operate with limited resources, including funding for technology and accessibility initiatives (Bawa, 2016). Many students in African higher education institutions need more access to devices such as laptops, tablets, or smartphones and reliable internet connectivity (Chirinda et al., 2021). Access is necessary for their ability to participate in digital learning environments and access online resources fully. These resource constraints can impede the development of accessible digital content and the provision of assistive technologies (Dookie, 2017). Academic staff and students may lack awareness and training on digital accessibility best practices (Ngubane-Mokiwa & Palmer, 2017). This knowledge gap can result in the creation of inaccessible digital materials and platforms. Some students may need more knowledge and skills in using digital technologies for learning (Chirinda et al., 2021). This can be due to a lack of exposure to digital tools or inadequate digital literacy

training. Students can navigate online platforms and effectively engage with digital learning materials with the necessary skills.

Africa's linguistic and cultural diversity challenges digital accessibility (Walton, 2018). Ensuring accessibility in multiple languages and accommodating diverse cultural contexts is complex and resource-intensive. Language and cultural barriers can impact digital accessibility in African higher education (Lyles et al., 2021). According to Laufer et al. (2021), digital learning materials and platforms may be available in something other than local languages, making it difficult for students to engage with the content thoroughly. Additionally, cultural factors may influence students' perceptions and attitudes towards digital learning, affecting their willingness to embrace digital technologies. Landa et al. (2021) assert that access to assistive technologies, such as screen readers or braille displays, may be limited in some regions (Thwala & Scott, 2014). Even when available, affordability and training in using these technologies can be barriers for students with disabilities (Dookie, 2017).

Furthermore, Socioeconomic disparities contribute to the digital divide in African higher education (Lyles et al., 2021). Students from lower-income backgrounds may face more significant challenges accessing digital devices and internet connectivity, exacerbating existing inequalities in educational opportunities. Creating accessible digital content, including documents, videos, and websites, can be challenging (Thwala & Scott, 2014). A lack of awareness about accessible content creation guidelines can lead to the exclusion of students with disabilities (Dookie, 2017). Policies and practices related to digital accessibility vary widely across African countries and institutions (West et al., 2019). The lack of comprehensive policies and adequate funding to support digital accessibility initiatives in African higher education institutions can impede progress (Lyles et al., 2021). With clear guidelines and financial resources, institutions can implement necessary infrastructure upgrades, provide training for academics, and ensure equitable access to digital resources.

Resistance to change and a lack of commitment to digital accessibility at the institutional level can be significant barriers (Walton, 2018). Shifting the institutional culture towards prioritising accessibility may require substantial effort and advocacy. Dookie (2017) asserts that the high cost of specialised assistive technologies can be prohibitive for students with disabilities. Also, there is a lack of comprehensive research and data on the specific needs and challenges of students with disabilities in African higher education (West et al., 2019). Thus, this gap hinders evidence-based policy and practice development. A complex web of issues, including infrastructure limitations, resource limitations, awareness gaps, cultural diversity, and policy variability, impedes the achievement of digital accessibility in African higher education. These barriers require a concerted effort from educational institutions, governments, and international partners to prioritise digital accessibility and ensure equitable access to quality education for all students, regardless of their abilities or circumstances. Thus, these challenges require a multi-faceted approach that includes policy reforms, infrastructure investments, digital literacy training, and efforts to bridge the socioeconomic and cultural gaps. By addressing these barriers, African higher education institutions can work towards achieving digital accessibility and ensuring equitable educational opportunities for all students.

Strategies to Enhance SDL in Digital Accessibility for Students' Achievement in Africa

To enhance self-directed learning and promote digital accessibility for students' achievement in African higher education, various strategies can be implemented (Bawa, 2016; Dookie, 2017; Beymer et al., 2022). Cox et al. (2022) suggest that learning institutions should embrace implementing digital literacy programmes that provide students with the necessary skills to navigate digital platforms effectively, access online resources, and engage in self-directed learning. These programmes should focus on building students' proficiency in digital tools, critical thinking, information evaluation, and online communication skills.

Chisita and Chizoma (2021) call for rethinking the provision of access to digital resources. This will ensure students can access various digital resources, including e-books, online journals, multimedia materials, and open educational resources. Collaboration can be encouraged with libraries, publishers, and educational institutions to provide affordable or accessible resources, particularly for students from disadvantaged backgrounds. Fostering a culture of self-directed learning among students should be enhanced. This will encourage students to take ownership of their learning process. Eccles and Wigfield (2023) argue for providing guidance and support to students in setting learning goals, developing study plans, and utilising digital tools for self-assessment and reflection. This can encourage students to explore diverse learning opportunities and engage in independent research. Afolabi and Ajani (2023) agree that creating interactive, engaging, and student-centred online learning environments will assist students in using multimedia elements, discussion forums, collaborative tools, and gamification techniques to enhance student engagement and motivation. Thus providing students with many opportunities (Johnson & Louw, 2017).

Significance of SDL in Online Learning Environments

Sumuer (2018) opines that SDL readiness is defined as the extent to which students have the attitude, abilities, and personality traits required for self-directed learning (Sumuer, 2018). This readiness significantly determines students' effectiveness in online learning environments (Sumuer, 2018). Students' SDL readiness was also found to positively influence their online learning effectiveness in a web-based learning environment (Sumuer, 2018). For several reasons, self-directed learning (SDL) in online learning environments is significant. Firstly, SDL empowers students to take control of their learning process, allowing them to set their own goals, determine their learning pace, and choose the resources and strategies that best suit their needs (Sumuer, 2018). This autonomy and flexibility can increase motivation and engagement, as students have a sense of ownership and agency in their learning journey.

Secondly, SDL in online learning environments promotes the development of essential skills such as critical thinking, problem-solving, and information literacy (Sumuer, 2018). Students must actively search for and evaluate information, analyse and synthesise knowledge, and apply their learning in real-world contexts. These skills are highly valued in today's knowledge-based society and are essential for lifelong learning and professional development. Furthermore, SDL in online learning environments fosters student independence and self-regulation (Sumuer, 2018). Students become responsible for managing their time, organising their learning activities, and monitoring their progress. This self-regulatory ability is crucial for success in online learning, where students have greater control over their learning process and must navigate the vast amount of information available. Moreover, SDL in online learning environments promotes student engagement and active participation (Sumuer, 2018). Students are encouraged to interact with course materials, engage in discussions and collaborative activities, and reflect on their learning experiences. This active engagement enhances knowledge retention and a deep understanding of the subject matter.

However, it is important to acknowledge that SDL in online learning environments may also present challenges. Students may need help managing their time effectively, staying motivated, and seeking support when needed (Sumuer, 2018). Therefore, academics and institutions must provide adequate support, guidance, and resources to facilitate students' SDL in online learning environments. SDL plays a significant role in online learning environments. It empowers students to take control of their learning, promotes the development of essential skills, fosters student independence and self-regulation, and enhances student engagement and active participation. Academics and institutions should recognise the importance of SDL and provide the necessary support to facilitate students' SDL in online learning environments.

Conclusion

The nexus between self-directed learning and learning attainment in online higher education environments is a complex and dynamic relationship with profound implications for academics and students. This comprehensive exploration has revealed that self-directed learning is pivotal in enhancing students' engagement, autonomy, and overall academic performance in online settings. It empowers students to take ownership of their education, adapt to diverse learning platforms, and effectively manage their learning processes. The literature review also underscores the significance of the situated expectancy-value theory as a valuable framework for understanding the motivational factors and contextual influences that shape self-directed learning in online higher education. It highlights the importance of considering students' beliefs, values, and the unique challenges they face within specific online learning contexts. However, this examination has also illuminated the challenges and barriers that can impede the successful implementation of self-directed learning in online higher education, especially in Africa. Issues such as limited infrastructure, resource constraints, and awareness gaps must be addressed to ensure equitable access to quality education. In light of these findings, it is evident that fostering self-directed learning in online higher education demands a multi-faceted approach that involves not only students but also instructors, institutions, policymakers, and technological advancements. By recognising and mitigating the challenges while capitalising on the benefits of self-directed learning, higher education can harness the full potential of online learning environments to provide inclusive, flexible, and effective education for all students, ultimately enhancing learning attainment and promoting lifelong learning in the digital age.

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