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Navigating E-Learning Challenges through Self-Regulated Learning: Resilience Strategies among University Students in Developing Countries

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ABSTRACT

The rapid adoption of e-learning in higher education, particularly in developing countries, aims to overcome geographical, infrastructural, and socio-economic barriers. Despite its potential, students in these regions face numerous challenges in fully engaging with online learning platforms. This study investigates the role of Self-Regulated Learning (SRL) and resilient strategies in helping students navigate these barriers. Data were collected through semi-structured interviews with open-ended questions, and analysed thematically. Twenty-four students (12 males and 12 females) from two universities in South Africa and Mozambique were interviewed to explore the strategies they employed to overcome technological, psychological, and contextual challenges. The findings reveal that students employ a combination of SRL and resilience strategies, such as goal setting, time management, self-monitoring, and peer support through platforms like WhatsApp and YouTube. A striking finding was the creation of peer-led YouTube channels by students, providing low-tech solutions for navigating e-learning platforms and offering educational support to their peers. These peer-led initiatives exemplify innovation and resilience, fostering collaboration in a resource-constrained environment. The study introduces the Self-Regulated Resilience Framework (SRRF) and highlights the significance of SRL and resilience in promoting student agency and resilience. Recommendations include the institutional integration of peer-led initiatives and SRL/resilience-focused training to enhance e-learning sustainability. Further research is needed to explore the scalability of these peer-driven strategies and their long-term impact on academic outcomes. The contribution of this study lies in its identification of these peer-led initiatives as scalable and innovative solutions for enhancing student engagement and success in e-learning.

Keywords: e-learning, higher education, challenges, self-regulated learning, resilience strategies.

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INTRODUCTION

The adoption of e-learning platforms in higher education has gained significant momentum worldwide, particularly in developing countries, where it aims to address longstanding issues such as overcrowded

classrooms, limited physical infrastructure, and geographical barriers.[1] The COVID-19 pandemic further accelerated the shift towards digital education, emphasising the importance of online learning to ensure the continuity of education during global disruptions.[2] However, despite the widespread integration of digital learning tools, students in developing countries continue to face various challenges that hinder their ability to engage fully and benefit from these platforms.[3]

Students in many developing countries struggle with unreliable internet connectivity, limited access to digital devices, and low levels of digital literacy.[4] These technological barriers are often compounded by economic inequalities, where many students cannot afford the necessary technology to participate in e-learning.[5] Furthermore, students in rural or remote areas face inconsistent access to electricity, which further hinders their engagement with e-learning.[6] These interconnected challenges constrain the potential of e-learning to enhance equitable access and educational outcomes, thereby reinforcing pre-existing inequalities within higher education systems.

In Southern Africa, South Africa and Mozambique embody the complex realities of implementing e-learning within resource-constrained higher education systems. Although universities have made significant strides in adopting learning management systems and digital platforms in South Africa, many students (particularly those from rural provinces and township areas) struggle with data costs, unstable internet access, and limited digital devices.[7] Public universities often rely on students' personal connectivity and digital literacy.[8] This means students use their data for e-learning and should master online platforms on their own. Despite national zero-rating initiatives, inconsistent implementation and network limitations have restricted equitable access.[9]

In Mozambique, the digital divide is even more pronounced: internet penetration remains low, institutional digital infrastructure is underdeveloped,[10] and both students and lecturers face challenges related

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[1] Mary Henrietta, "Exploring the Evolution and Implications of E-Learning Ecosystems," in *Pedagogical Revelations and Emerging Trends* (CRC Press, 2025), 144–47.

[2] Pradeep Kumar Choudhury and Amit Kumar, "COVID-19 and Digital Learning in Higher Education in India: Unpacking the Inequity in Students' Experiences," in *The Evolving Landscape of Higher Education in India* (Singapore: Springer Nature Singapore, 2024), 121–35, https://doi.org/10.1007/978-981-97-9270-2_9.

[3] Eduardo Bizzo, "Acceptance and Resistance to E-Learning Adoption in Developing Countries: A Literature Review," *Ensaio: Avaliação e Políticas Públicas Em Educação* 30, no. 115 (2022): 458–83, https://doi.org/10.1590/s0104-403620220003003342; Richard Boateng et al., "Determinants of E-Learning Adoption among Students of Developing Countries," *The International Journal of Information and Learning Technology* 33, no. 4 (August 1, 2016): 248–62, https://doi.org/10.1108/IJILT-02-2016-0008; Sunday C. Eze et al., "Factors Influencing the Use of E-Learning Facilities by Students in a Private Higher Education Institution (HEI) in a Developing Economy," *Humanities and Social Sciences Communications* 7, no. 1 (October 27, 2020): 133, https://doi.org/10.1057/s41599-020-00624-6.

[4] Eze et al., "Factors Influencing the Use of E-Learning Facilities by Students in a Private Higher Education Institution (HEI) in a Developing Economy"; Kim Hoe Looi, "Determinants of Future Preference for E-Learning and Its Implications: A Study of Malaysian Business Students," *Issues in Educational Research* 31, no. 3 (2021): 914–29; Choudhury and Kumar, "COVID-19 and Digital Learning in Higher Education in India: Unpacking the Inequity in Students' Experiences."

[5] Choudhury and Kumar, "COVID-19 and Digital Learning in Higher Education in India: Unpacking the Inequity in Students' Experiences"; Kashfia Maisha and Sabakun Naher Shetu, "Influencing Factors of E-Learning Adoption amongst Students in a Developing Country: The Post-Pandemic Scenario in Bangladesh," *Future Business Journal* 9, no. 1 (2023): 37, https://doi.org/10.1186/s43093-023-00214-3.

[6] M. E. Letsoalo and T. P. Makgakga, "Exploring Pre-Service Mathematics Students' Videoconferencing Experiences: A Case of Open and Distance e-Learning in South Africa," *African Perspectives of Research in Teaching and Learning*, 2024, https://doi.org/10.70875/v8i2article16; Danica Anne Sims, "Online Education and Learning Management System Usage in a South African Economic and Management Faculty during COVID-19," *E-Learning and Digital Media* 22, no.5(2025):465–83.

[7] Khulekani Yakobi et al., "The Challenges and Opportunities of E-Learning in an Emerging University in South Africa.," *International Journal of Education and Development Using Information and Communication Technology* 21, no. 1 (2025): 1–15; Tebogo Kekana and M J Mogoboya, "Factors That Impact on E-Learning in a Selected South African University: A Pedagogical Perspective," *Special Education* 2, no. 43 (2022).

[8] Wilson Mugizi and Judith Nagasha, "E-Learning,"*Conceptualizations of Africa: Perspectives from Sciences and Humanities*, 2025,143–63.

[9] R.M.S Molokwane and Luther-King Junior Zogli, "Perceptions of First-Year Students from Disadvantaged Backgrounds of e-Learning at the Durban University of Technology, South Africa," *Progressio* 42 (2021): 17.

[10] Maria Salite, Ana Paula Afonso, and Lina Morgado, "Models And Practices Of Elearning Use At The Catholic University Of Mozambique: A Case Study," 2022, 3964–73, https://doi.org/10.21125/iceri.2022.0964.

to digital literacy and language barriers in online content.[11] Most students rely on mobile phones to access e-learning platforms, which constrains participation in activities that demand higher bandwidth or complex software.[12] These contextual constraints position South Africa and Mozambique as illustrative cases of developing countries where e-learning adoption is advancing amid significant technological and socio-economic challenges.

While much of the existing research has examined the structural and technological barriers to e-learning in developing countries,[13] limited attention has been given to how students themselves. Most studies tended to focus on system-level deficiencies rather than learner-driven adaptation strategies. Consequently, a gap remains in understanding how students exercise agency and self-regulation to sustain their learning in constrained digital environments. Addressing this gap is vital for uncovering the mechanisms through which students in developing contexts develop resilience and persist in their academic pursuits despite external limitations.

In response to these obstacles, students in developing countries must employ strategies to navigate the complexities of e-learning. Self-Regulated Learning (SRL) has emerged as a critical approach, enabling students to take control of their learning process through goal setting, time management, self-monitoring, and reflective practices.[14] These strategies enable learners to adapt to their contexts and manage learning barriers proactively. By engaging in SRL, students can cultivate resilience. Resilience is the capacity to persist and thrive amid adversity, and is particularly relevant in low-resource e-learning settings.[15] Understanding how SRL and resilience interact can, therefore, illuminate how students cope with transform challenges into opportunities for autonomous and adaptive learning.

Against this backdrop, the present study investigates how university students in South Africa and Mozambique employ SRL strategies to overcome the technological, psychological, and contextual barriers associated with e-learning. Specifically, the study explores how SRL processes foster resilience and enable students to sustain learning engagement in resource-constrained higher education environments. The findings aim to contribute to the broader discourse on student-centred e-learning by revealing how learners in developing contexts actively construct strategies to enhance their academic success. The research objectives are to:

1. Explore how university students apply technological strategies to sustain e-learning resilience in developing countries.
2. Identify the psychological and emotional self-regulation strategies university students apply to sustain e-learning resilience in developing countries.
3. Establish social support strategies that enhance university students' e-learning resilience in developing countries?

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[11] Domingos Luis Rhongo and Bonifacio da Piedade, "E-Student in the Mozambican Context: An Analysis of Higher Education Students' Challenges Regarding to E-Learning Implementation," 2024, 343–54, https://doi.org/10.1007/978-3-031-51979-6_36.

[12] Helio Rogerio Martins et al., "Online Learning during COVID-19 Emergency-a Descriptive Study of University Students' Experience in Mozambique," *Journal of Applied Learning & Teaching* 4, no. 1 (2021): 29–37; Filipe Mahaluça et al., "Innovation in the Teaching-Learning Process in Higher Education in COVID-19 Time in Mozambique," *J Huma Soci Scie 5 (1): 01* 5 (2021).

[13] Bizzo, "Acceptance and Resistance to E-Learning Adoption in Developing Countries: A Literature Review"; Boateng et al., "Determinants of E-Learning Adoption among Students of Developing Countries"; Eze et al., "Factors Influencing the Use of E-Learning Facilities by Students in a Private Higher Education Institution (HEI) in a Developing Economy"; Syed Hamid Hussain Madni et al., "Factors Influencing the Adoption of IoT for E-Learning in Higher Educational Institutes in Developing Countries," *Frontiers in Psychology* 13 (July 8, 2022), https://doi.org/10.3389/fpsyg.2022.915596; Maila Mushtaq, Aster Noor, and Nosheen Sabahat, "Adoption Barriers of E-Learning in Heigher Education Institutes (HEI's) of Developing Countries - A Systematic Literature Review," in *2021 International Conference on Innovative Computing (ICIC)* (IEEE, 2021), 1–8, https://doi.org/10.1109/ICIC53490.2021.9693081.

[14] Dale H. Schunk and Barry J. Zimmerman, "Self-Regulation and Learning," in *Handbook of Psychology* (Wiley, 2003), 59–78, https://doi.org/10.1002/0471264385.wei0704; Daria Bylieva et al., "Self-Regulation in E-Learning Environment," *Education Sciences* 11, no. 12 (December 2, 2021): 785, https://doi.org/10.3390/educsci11120785; Chiu-Lin Lai and Gwo-Jen Hwang, "Strategies for Enhancing Self-Regulation in e-Learning: A Review of Selected Journal Publications from 2010 to 2020," *Interactive Learning Environments* 31, no. 6 (August 18, 2023): 3757–79, https://doi.org/10.1080/10494820.2021.1943455.

[15] Ann S Masten, Kayla M Nelson, and Sarah Gillespie, "Resilience and Student Engagement: Promotive and Protective Processes in Schools," in *Handbook of Research on Student Engagement* (Springer, 2022), 239–55.

4. Ascertain how Self-Regulated Learning strategies enable students to develop e-learning resilience in developing countries?

The remainder of this paper is structured as follows: The next section reviews the literature on e-learning challenges and learner adaptation in developing countries.This is followed by the theoretical framework, which outlines the guiding theories of SRL and Resilience. The methodology section then details the research design, participants, and data analysis procedures. Subsequent sections present the key findings and discussion, and the paper concludes with theoretical and practical implications for higher education institutions seeking to enhance student resilience in digital learning environments.

LITERATURE REVIEW

E-learning in higher education offers numer[16]ous benefits, such as flexibility and increased accessibility.[17] However, e-learning presents substantial challenges, particularly in developing countries where students face significant barriers to full engagement with online learning environments. These challenges can be broadly categorised into technological, psychological, and contextual barriers, all of which can hinder students' ability to use digital learning tools effectively.[18]

Technological Challenges

The most apparent technological challenge faced by students in developing countries is poor internet connectivity. Many students in rural and underserved areas experience slow or unreliable internet access,[19] which limits their ability to attend online classes, access resources, and participate in live discussions.[20] Additionally, the limited availability of digital devices is another significant issue, with many students relying on smartphones or outdated computers that do not meet the requirements for modern e-learning.[21] Moreover, low digital literacy remains a substantial barrier. As espoused by Wema, many students struggle to navigate e-learning platforms, use necessary software, and communicate effectively online, which can lead to disengagement and frustration.[22]

[16] Boadi Agyekum, Waad Ali, and Robert Lawrence Afutu-Kotey, "Continuing Education and Perception of Community Learning Centres: A Case Study of the University of Ghana Community Learning Centres, Ghana," *Journal of Adult and Continuing Education* 30, no. 1 (May 13, 2024): 193–215, https://doi.org/10.1177/14779714231189617; GholamReza Zandi, Husam A E Lahrash, and Fadya Ramadan Shakhim, "Factors Effecting the Adoption of E-Learning: An Empirical Study of Libyan Universities," *Journal of Information Technology Management* 14, no. 4 (2022): 95–117.

[17] Alejandro Valencia-Arias, Salim Chalela-Naffah, and Jonathan Bermúdez-Hernández, "A Proposed Model of E-Learning Tools Acceptance among University Students in Developing Countries," *Education and Information Technologies* 24, no. 2 (March 27, 2019): 1057–71, https://doi.org/10.1007/s10639-018-9815-2.

[18] Rachael Njeri Kibuku, Prof. Daniel Orwa Ochieng, and Prof. Agnes Nduku Wausi, "E-Learning Challenges Faced by Universities in Kenya: A Literature Review," *Electronic Journal of E-Learning* 18, no. 2 (February 1, 2020), https://doi.org/10.34190/EJEL.20.18.2.004; Mushtaq, Noor, and Sabahat, "Adoption Barriers of E-Learning in Heigher Education Institutes (HEI's) of Developing Countries - A Systematic Literature Review"; Muhammad Arsam Qazi, Muhammad Aiyaz Sharif, and Ather Akhlaq, "Barriers and Facilitators to Adoption of E-Learning in Higher Education Institutions of Pakistan during COVID-19: Perspectives from an Emerging Economy," *Journal of Science and Technology Policy Management* 15, no. 1 (January 2, 2024): 31–52, https://doi.org/10.1108/JSTPM-01-2022-0002.

[19] D. K. Ali, "Investigating the Students' Expectation about the Quality of E-Learning in Pakistan," *SSRN 4691451*, 2024; Zandi, Lahrash, and Shakhim, "Factors Effecting the Adoption of E-Learning: An Empirical Study of Libyan Universities."

[20] Muhammad Mujtaba Asad et al., "Integration of E-Learning Technologies for Interactive Teaching and Learning Process: An Empirical Study on Higher Education Institutes of Pakistan," *Journal of Applied Research in Higher Education* 13, no. 3 (June 7, 2021): 649–63, https://doi.org/10.1108/JARHE-04-2020-0103.

[21] Zandi, Lahrash, and Shakhim, "Factors Effecting the Adoption of E-Learning: An Empirical Study of Libyan Universities."

[22] Evans F Wema, "Developing Information Literacy Courses for Students through Virtual Learning Environments in Tanzania: Prospects and Challenges," *IFLA Journal* 47, no. 4 (2021): 559–69.

Psychological Challenges

The psychological impact of e-learning is a critical issue. Students often face motivation challenges, particularly when studying in isolation without the social interaction of traditional classroom settings.[23] The lack of face-to-face interactions with instructors and peers can lead to feelings of disconnection, boredom, and isolation, which can negatively affect student engagement.[24] The cited scholars contend that the flexibility of online learning, while advantageous in many ways, can lead to time management difficulties. Without the structure of in-person classes, many students struggle to create consistent study schedules, which can lead to procrastination and inconsistent learning habits that negatively impact their academic outcomes.[25]

Contextual Challenges

In many developing countries, socio-economic factors play a crucial role in e-learning participation. Economic disparities mean that many students cannot afford the technology required to fully engage with e-learning systems, such as laptops, reliable internet access, or even electricity during power outages.[26] The digital divide is particularly pronounced in rural areas, where inadequate infrastructure exacerbates the challenges faced by students.[27] Moreover, family responsibilities, such as caring for younger siblings or contributing to household income, further limit the time and resources students can devote to their studies.[28]

SRL Strategies in E-Learning Contexts

Research on SRL in e-learning environments emphasises the importance of metacognitive strategies such as self-monitoring and reflection, as well as motivational strategies like goal setting and self-efficacy.[29] These strategies help students stay engaged and focused, even when faced with technological disruptions or resource limitations.[30] For example, SRL strategies like time management, goal setting, and self-reflection help students adapt to technological challenges.[31] On the other hand, collaborative learning strategies—such as peer support via WhatsApp or Facebook groups—help overcome psychological and contextual challenges, including isolation and lack of motivation.[32]

By using SRL, students manage their learning while also developing a sense of agency and empowerment, enabling them to thrive in environments where external structures and resources are limited.[33] Research has shown that peer support and collaborative learning can also serve as practical tools for mitigating e-learning barriers.[34] When students collaborate through low-tech digital tools, they can support each other academically, share resources, and foster a sense of community,[35] which is particularly important in e-learning environments that can otherwise feel isolating.

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[23] ZUNAIRA Zahid and M Basir, "Assessing the Impact of Interactivity on E-Learning Quality: A Quantitative Investigation in Higher Education Institutes of Pakistan," *Psychology and Education* 58, no. 3 (2021): 3132–45.

[24] Choudhury and Kumar, "COVID-19 and Digital Learning in Higher Education in India: Unpacking the Inequity in Students' Experiences."

[25] Lai and Hwang, "Strategies for Enhancing Self-Regulation in e-Learning: A Review of Selected Journal Publications from 2010 to 2020."

[26] Choudhury and Kumar, "COVID-19 and Digital Learning in Higher Education in India: Unpacking the Inequity in Students' Experiences."

[27] Wondifraw Dejene and Dagmawit Tilahun, "How Ready Are Our Students for E-Learning? Evidence from Ethiopia," *Discover Education* 3, no. 1 (December 20, 2024): 283, https://doi.org/10.1007/s44217-024-00359-5.

[28] Kibuku, Ochieng, and Wausi, "E-Learning Challenges Faced by Universities in Kenya: A Literature Review."

[29] Schunk and Zimmerman, "Self-Regulation and Learning."

[30] Bylieva et al., "Self-Regulation in E-Learning Environment."

[31] Barry J. Zimmerman, "Dimensions of Academic Self-Regulation," in *Self-Regulation of Learning and Performance* (New York: Routledge, 2022), 3–21, https://doi.org/10.4324/9780203763353-1.

[32] Ahmad Samed Al-Adwan et al., "Towards a Sustainable Adoption of E-Learning Systems: The Role of Self-Directed Learning.," *Journal of Information Technology Education: Research* 21 (2022).

[33] Bylieva et al., "Self-Regulation in E-Learning Environment."

[34] Choudhury and Kumar, "COVID-19 and Digital Learning in Higher Education in India: Unpacking the Inequity in Students' Experiences";Phutela and Dwivedi, "A Qualitative Study of Students' Perspective on e-Learning Adoption in India."

[35] Rachael H Merola, "Online Learning's Potential to Improve Access and Quality in Higher Education in Mexico: Perspectives of Higher Education Stakeholders," *Journal of Education and E-Learning Research* 12, no. 1 (February 25, 2025): 94–103, https://doi.org/10.20448/jeelr.v12i1.6448.

While existing research highlights various technological, psychological, and contextual challenges faced by students in developing countries, a significant gap remains in understanding how SRL strategies can help students mitigate these barriers. Few studies have explored the practical application of SRL in overcoming the unique challenges of e-learning in resource-limited environments. Therefore, there is a need for further research into how SRL strategies, especially when combined with peer support and low-tech digital tools, can enhance students' engagement and learning outcomes in e-learning contexts – hence the current study. The following section outlines the theoretical framework that informs the study.

THEORETICAL FRAMEWORK

This study adopts a hybrid theoretical framework: the Self-Regulated Resilience Framework (SRRF), which integrates Self-Regulated Learning (SRL) and Resilience Theory to explain how university students in developing countries sustain engagement and adaptability in e-learning environments.[36] The framework conceptualises resilience not as an isolated trait but as a process strengthened by learners' capacity for self-regulation, goal orientation, and reflective adaptation to adversity. In this case, adversity refers to various e-learning challenges common in developing countries.

Self-Regulated Learning (SRL) Theory

SRL theory provides the cognitive and metacognitive foundation for understanding how learners take active control of their learning processes. According to Zimmerman, SRL comprises three cyclical phases: *forethought* (goal setting and strategic planning), *performance* (self-monitoring and time management), and *self-reflection* (evaluation and strategy adjustment).[37] These processes enable students to plan, monitor, and assess their progress independently.In developing-country e-learning contexts, where students face limited internet access, inadequate digital infrastructure, and inconsistent institutional support, SRL strategies are critical.[38] They help learners manage distractions, maintain motivation, and persist despite challenges.[39] In essence, through SRL, students become autonomous, adaptive, and resilient learners capable of navigating fluctuating learning environments.

Resilience Theory

Resilience Theory, as advanced by Masten, refers to the capacity to maintain or regain functionality amid adversity.[40] Within e-learning, resilience manifests as students' ability to recover from setbacks such as technological failures, emotional fatigue, or social isolation. Importantly, resilience is not fixed: it evolves through interaction with personal, social, and environmental factors.[41]

In low-resource educational settings, resilience enables learners to sustain academic engagement despite systemic and psychological pressures.[42] Emotional regulation, problem-solving, and social support are key elements that reinforce persistence and adaptability.[43] Thus, resilience complements SRL by providing the affective and contextual grounding necessary for learners to endure and grow within challenging learning conditions.

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[36] Barry J. Zimmerman, "Becoming a Self-Regulated Learner: An Overview," *Theory Into Practice* 41, no. 2 (May 2002): 64–70, https://doi.org/10.1207/s15430421tip4102_2; Ann S. Masten, "Pathways to Integrated Resilience Science," *Psychological Inquiry* 26, no. 2 (April 3, 2015): 187–96, https://doi.org/10.1080/1047840X.2015.1012041.

[37] Barry J Zimmerman, "Dimensions of Academic Self-Regulation: A Conceptual Framework for Education," in *Self-Regulation of Learning and Performance* (Routledge, 2023), 3–21.

[38] Yakobi et al., "The Challenges and Opportunities of E-Learning in an Emerging University in South Africa."

[39] Schunk and Zimmerman, "Self-Regulation and Learning."

[40] Masten, "Pathways to Integrated Resilience Science."

[41] Masten, Nelson, and Gillespie, "Resilience and Student Engagement: Promotive and Protective Processes in Schools."

[42] Yoesoep Edhie Rachmad, "Educational Resilience Theory" (Ravenna Mosaici Libri Internazionali, 2022).

[43] Ann S. Masten, "Multisystem resilience: pathways to an integrated framework.," *Research in Human Development* 18, no. 3 (July 3, 2021): 153–63, https://doi.org/10.1080/15427609.2021.1958604.

The Self-Regulated Resilience Framework (SRRF)

The SRRF integrates the strategic dimensions of SRL with the adaptive strength of Resilience Theory. It proposes that learners in developing countries draw upon SRL strategies (such as goal-setting, time management, and reflection) to build resilience that, in turn, sustains their learning persistence under adverse conditions.[44] The interaction between these two constructs is reciprocal: SRL enhances resilience by fostering proactive learning behaviour, while resilience reinforces SRL by enabling learners to recover and adapt after challenges (see Figure 1).

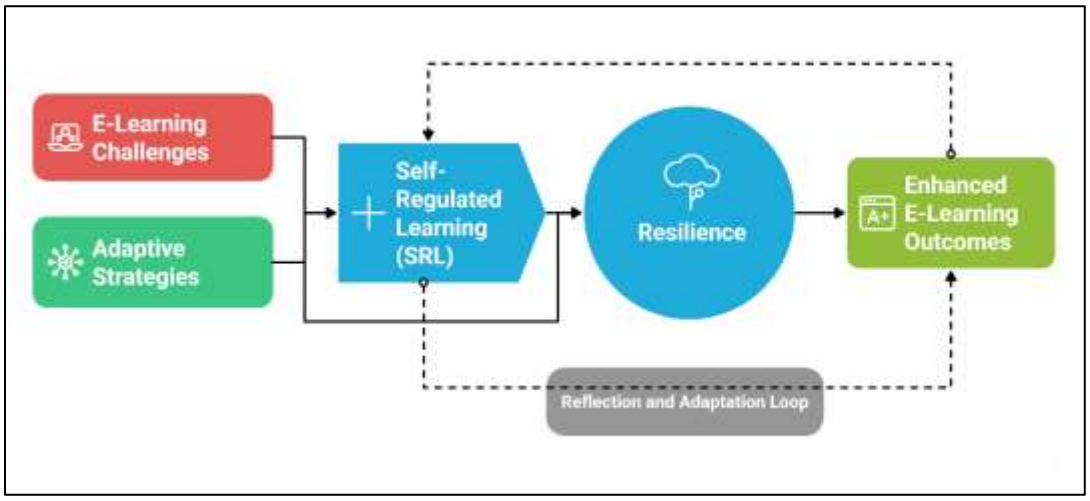

Figure 1. The Self-Regulated Resilience Framework (SRRF)

The SRRF (Figure 1) illustrates how technological, psychological, and social factors interconnect through SRL and resilience processes. Students apply SRL strategies to manage their learning environment, while resilience mechanisms such as emotional regulation, adaptability, and social support buffer the negative impacts of e-learning challenges.[45] Together, these dimensions explain how learners sustain engagement, motivation, and performance in resource-constrained contexts. The next section presents the methodology employed to investigate these strategies and their impact on students' ability to overcome e-learning challenges.

METHODOLOGY

This study adopted a qualitative phenomenological approach to investigate students' lived experiences with e-learning in higher education. The phenomenological method was chosen to facilitate an in-depth exploration of participants' subjective experiences, providing rich, contextual insights into how students navigate, interpret, and are affected by digital learning systems within their institutions.[46] This approach is particularly well-suited for examining complex educational experiences that are shaped by the interplay of technological, institutional, and socio-cultural factors.

Research Setting and Participants

The research was conducted across two higher education institutions in developing countries, one in South Africa (University A) and another in Mozambique (University B). These universities were selected purposefully to represent varied contexts regarding infrastructure, policy environments, and stages of digital

[44] Zimmerman, "Dimensions of Academic Self-Regulation: A Conceptual Framework for Education."
[45] Schunk and Zimmerman, "Self-Regulation and Learning"; Emnet Tadesse Woldegiorgis and Otilia Chiramba, "Access and Success in Higher Education: Fostering Resilience in Historically Disadvantaged Students in South Africa," *Journal of Applied Research in Higher Education* 17, no. 2 (2025): 759–71.
[46] M. J. Mayan, *Essentials of Qualitative Inquiry* (Taylor & Francis, 2023).

learning adoption.[47] Pseudonyms are used for these institutions to ensure confidentiality in line with ethical research practices. A total of 24 students (coded S1-S24) were selected through purposive sampling, ensuring a diverse and well-rounded sample that could provide rich and varied perspectives.[48] Selection criteria included gender parity, representation across both undergraduate and postgraduate levels, and inclusion from various academic faculties and professional backgrounds. This approach ensured that the participants had substantial experience with integrated e-learning systems and could offer meaningful insights into both enabling conditions and systemic challenges. The final participant group consisted of 12 male and 12 female students, aged between 17 and 60 years. Of these, approximately half were enrolled in undergraduate programmes (first to fourth year), while the other half were pursuing postgraduate qualifications (honours, master's, or doctoral studies). The students represented a range of academic disciplines, including business and economics, education, humanities, information technology, and law, providing a cross-disciplinary perspective on institutional digital practices (see Table 1).The inclusion of participants from diverse demographic and academic backgrounds enhances the depth, credibility, and representativeness of the study.[49] Since the study explores SRL and resilience strategies in e-learning within developing countries, variation across age groups, educational levels, disciplines, and institutional contexts allows for a richer understanding of how students *experience* and *respond* to challenges in different settings. Older and postgraduate students, for instance, may demonstrate more advanced self-regulatory and coping mechanisms compared to younger undergraduates. At the same time, disciplinary differences can influence access to technology and preferred learning strategies. Including both male and female participants further ensures gender-balanced insights into resilience processes.

Moreover, sampling from two universities situated in distinct national and institutional contexts broadens the transferability of the findings by capturing institutional differences in technological support, pedagogical design, and resource availability.[50] In qualitative inquiry, such maximum variation sampling enables the researcher to identify common patterns across diverse experiences, thus strengthening the conceptual robustness of the hybrid SRL–Resilience framework (SRRF).[51]

Data Collection

Data were collected through semi-structured interviews with open-ended questions, allowing participants to provide detailed personal accounts of their experiences with e-learning. This format was well-suited to the phenomenological design of the study, as it enabled participants to express their thoughts and reflections in their terms while allowing the interviewer to probe deeper into emerging themes.[52] The semi-structured format also ensured that key thematic areas related to the study were consistently covered across interviews, while maintaining flexibility for new insights to emerge.[53] Interviews were conducted either in person or online, depending on the participants' availability and autonomy. Each interview lasted between 30 and 45 minutes, was audio-recorded with the participant's consent and was transcribed verbatim for analysis. The data collection phase spanned four weeks, including recruitment, interview scheduling, and follow-up engagements where necessary.

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[47] Albine Moser and Irene Korstjens, "Series: Practical Guidance to Qualitative Research. Part 3: Sampling, Data Collection and Analysis," *European Journal of General Practice* 24, no. 1 (January 1, 2018): 9–18, https://doi.org/10.1080/13814788.2017.1375091.
[48] Sarah J. Tracy, *Qualitative Research Methods: Collecting Evidence, Crafting Analysis, Communicating Impact* (John Wiley & Sons, 2024).
[49] Elizabeth J Tisdell, Sharan B Merriam, and Heather L Stuckey-Peyrot, *Qualitative Research: A Guide to Design and Implementation* (John Wiley & Sons, 2025).
[50] Robert Coe et al., *Research Methods and Methodologies in Education* (SAGE Publications Limited, 2025).
[51] Mayan, *Essentials of Qualitative Inquiry*.
[52] J. W. Creswell and C. N. Poth, *Qualitative Inquiry and Research Design: Choosing among Five Approaches* (SAGE Publications, 2018).
[53] Victoria Clarke and Virginia Braun, "Thematic Analysis," in *Encyclopedia of Critical Psychology* (Springer, 2014), 1947–52.

Table 1: Participants' Demographic Data (n = 24)

Participant Code	Institution	Gender	Age Category	Education Level	Faculty/Department	Year of Study
S1	A	Male	17–30	Graduate	Humanities	Second year
S2	A	Female	17–30	Postgraduate	Educational & Professional Studies	Masters
S3	A	Female	31–40	High school	Humanities	First year
S4	A	Male	41–50	Tertiary	Design & Studio Arts	Third year
S5	A	Female	17–30	Graduate	Engineering & IT	Fourth year
S6	A	Male	31–40	Postgraduate	Humanities	Doctoral
S7	A	Female	41–50	Postgraduate	Humanities	Honours
S8	A	Male	17–30	High school	Humanities	First year
S9	A	Female	31–40	Tertiary	Humanities	Third year
S10	A	Male	41–50	Postgraduate	Humanities	Doctoral
S11	A	Female	17–30	Graduate	Educational & Professional Studies	Second year
S12	A	Male	31–40	Postgraduate	Humanities	Masters
S13	B	Female	17–30	High school	Tourism	First year
S14	B	Male	51–60	Postgraduate	Business School	Masters
S15	B	Male	17–30	Tertiary	Info Sciences & Tech	Third year
S16	B	Female	41–50	Postgraduate	Business School	Fourth year
S17	B	Female	31–40	Graduate	Business School	Doctoral
S18	B	Male	41–50	Postgraduate	Humanities & Ethics	Masters
S19	B	Female	17–30	High school	Business School	First year
S20	B	Male	31–40	Graduate	Business School	Honours
S21	B	Female	17–30	Postgraduate	Info Sciences & Tech	Doctoral
S22	B	Male	41–50	Postgraduate	Law	Doctoral
S23	B	Female	51–60	High school	Tourism	Third year
S24	B	Male	17–30	Tertiary	Central Registry	Second year

Data Analysis

The analysis of interview data was conducted using thematic analysis, guided by principles of phenomenological inquiry propounded by Braun and Clarke.[54] To that end, transcripts were reviewed iteratively, with initial codes being generated inductively and grouped into broader categories based on emerging patterns. These categories were then organised according to relevant thematic frameworks, enabling a comprehensive analysis of technological and social dynamics within the e-learning context. To ensure the credibility and rigour of the analysis, member checking was employed, with selected participants reviewing the interpretations to verify their accuracy.[55] Additionally, peer debriefing was conducted with academic colleagues familiar with qualitative research, further enhancing the reliability of the coding process

Ethical Considerations

The study adhered to the ethical guidelines outlined by academic research standards, ensuring transparency, respect for participants' privacy, and safeguarding their rights throughout the research process. Ethical approval for the study (FRIC 08/23/01) was obtained from the institutional research ethics committees of both participating universities, as emphasised by Creswell and Poth.[56] Participants were fully informed about the purpose of the study, the procedures involved, and their rights, including the right to withdraw at any point without consequence. Informed consent was obtained from all participants before the interviews. Confidentiality was maintained using pseudonyms for both institutions and participants, and all data were securely stored and anonymised to protect participants' identities.

PRESENTATION OF RESULTS /FINDINGS

The findings from the interviews revealed that students in developing countries employ various SRL and resilience strategies to navigate technological, psychological, and contextual barriers in e-learning environments. These strategies can be grouped into four main themes: technological, psychological and emotional strategies, social support, and SRL strategies. Table 1 summarises the key themes and subthemes derived from the students' experiences.

Table 2: Summary of Themes and Subthemes

Themes	Subthemes	Examples
Technological Resilience Strategies	Internet connectivity management	Downloading materials during off-peak hours
	Device limitations and adaptation	Reliance on smartphones for access
	Digital literacy and technical navigation	Using YouTube tutorials for platform navigation
Psychological and Emotional Resilience Strategies	Time management	Use of digital reminders and creating personalised schedules
	Goal setting and motivation	Writing down weekly goals to maintain focus
	Emotional support through peer communication	Using WhatsApp/Facebook groups to stay connected
Social Support Strategies	Peer support via online groups	WhatsApp group chats for sharing notes and clarifying doubts
	Peer-led learning	YouTube channels created by students for platform tutorials

[54] Clarke and Braun, "Thematic Analysis."
[55] Mayan, *Essentials of Qualitative Inquiry*.
[56] Creswell and Poth, *Qualitative Inquiry and Research Design: Choosing among Five Approaches* .

Self-Regulated Learning (SRL) Strategies	Goal setting	Setting specific academic targets to reduce stress
	Self-monitoring and reflection	Weekly progress reviews and adjustments
	Creating structured routines	Establishing consistent study hours

Source: Researchers' synthesis from the data

Technological Resilience Strategies

A significant barrier identified by students was internet connectivity. For example, S1 mentioned, "I often download materials at night when the connection is better, to avoid interruptions during the day." This strategy of downloading materials in advance helps students bypass poor connectivity during peak hours, which echoes challenges in existing literature on unreliable internet access in developing countries.[57] Device limitations also posed challenges, with many students relying on smartphones due to a lack of access to computers or reliable devices. S4 shared, "I use my phone for everything, but it's hard to view large files or attend live classes on it." Students adapted by focusing on data-efficient content, such as text-based resources, and avoiding multimedia-heavy materials that their devices could not support. This aligns with previous research on device-related constraints in developing countries.[58] Furthermore, students reported struggling with digital literacy. S8 noted, "I didn't know how to use the platform at first, but after watching YouTube videos and asking S3, I got the hang of it." Peer support and external resources like YouTube tutorials helped students overcome technical hurdles. These findings reinforce that peer-led informal learning can mitigate digital illiteracy in low-resource settings.

Psychological and Emotional Resilience Strategies

Time management emerged as a crucial psychological strategy for students. S10 shared, "I set reminders on my phone to help me stick to my study times, as online classes don't have a fixed schedule." Digital reminders and personalised schedules helped students manage their time more effectively, reflecting previous research on time management in online learning.[59] Additionally, goal setting proved vital for maintaining motivation. S15 stated, "I write down small goals every week, like completing a module or learning to use a new tool." This aligns with SRL frameworks, where goal setting plays a central role in sustaining focus and engagement.[60] Students also faced emotional challenges, particularly isolation. S20 explained, "Sometimes I feel disconnected, but I use group chats to talk to other students and stay motivated." Peer support via WhatsApp and Facebook groups provided both academic assistance and emotional support, helping to combat loneliness and foster a sense of belonging in online learning environments.

Social Support Resilience Strategies

Students increasingly used social support strategies such as peer support networks to overcome isolation and resource limitations. S5 stated, "WhatsApp groups really help. We share notes, ask questions, and talk about what we don't understand." These peer-led study groups offered academic and emotional support, making up for the lack of structured in-person interactions in e-learning environments. This finding aligns with research on the role of peer support in online learning.[61] A particularly novel finding was the creation of peer-led YouTube channels. S2 shared, "I noticed many classmates struggled with using the LMS, so I made a tutorial series on navigating the system. It helped many who were unfamiliar with the platform." These student-led initiatives not only helped students overcome technical challenges but also empowered peers by providing instructional resources outside of formal learning structures.

[57] Dejene and Tilahun, "How Ready Are Our Students for E-Learning? Evidence from Ethiopia."
[58] Choudhury and Kumar, "COVID-19 and Digital Learning in Higher Education in India: Unpacking the Inequity in Students' Experiences."
[59] Bylieva et al., "Self-Regulation in E-Learning Environment."
[60] Dale H Schunk and Barry J Zimmerman, "Self-Regulation in Education: Retrospect and Prospect," in *Self-Regulation of Learning and Performance* (Routledge, 2023), 305–14.
[61] Merola, "Online Learning's Potential to Improve Access and Quality in Higher Education in Mexico: Perspectives of Higher Education Stakeholders."

The creation of such content reflects self-regulation in action and highlights the scalability of peer-led initiatives to address e-learning barriers.

Self-Regulated Learning (SRL) Strategies

Goal setting was one of the most frequently used SRL strategies. S13 remarked, "I set specific goals for myself, like completing my assignments a week early, to avoid last-minute stress." This aligns with the forethought phase of SRL, where students establish their academic intentions and direct their efforts accordingly.[62] Self-monitoring and reflection also played a significant role in students' success. S6 noted, "I always review my progress every weekend and plan what I can improve next week." These weekly progress reviews allowed students to assess their strengths and identify areas for improvement, enhancing their learning outcomes. To manage the lack of structured schedules in e-learning, students established fixed study hours. S11 explained, "Having a routine really helps. I dedicate three hours every morning to study, so I stay consistent." This routine-building reflects SRL principles of self-regulation and time management, which are essential for success in online learning environments.[63]

Table 3: Strategies and Their Effectiveness in Overcoming E-Learning Challenges

Strategy	Student Example (S1-S24)	Challenge Addressed	Effectiveness & Outcome
Goal setting	S13: "I set specific goals to complete assignments early"	Motivation, time management	Enhanced focus, reduced procrastination
Self-monitoring	S6: "I review my progress weekly and adjust my study plan"	Time management, self-reflection	Improved task management and reflection
Social support (WhatsApp/Facebook)	S5: "WhatsApp groups help share notes and clarify doubts"	Isolation, lack of engagement	Increased engagement and emotional support
Creating routines	S11: "I dedicate 3 hours every morning to study"	Lack of structure, motivation	Consistent progress, enhanced time management
Peer-led content (YouTube)	S2: "I created a YouTube channel to explain concepts to peers"	Technological limitations, peer support	Empowered peers, broadened access to resources

Source: Researchers' synthesis from the data

The results indicate that SRL-resilience strategies, such as time management, goal setting, and social support, were key to overcoming technological, psychological, and contextual challenges in e-learning. These strategies helped students mitigate issues like poor internet connectivity, isolation, and lack of academic support. Notably, the creation of peer-led YouTube channels demonstrated students' agency in overcoming technical barriers, further enhancing their learning environment. These findings highlight the resilience of students and suggest that peer-driven initiatives could be a scalable solution in resource-constrained e-learning environments.

DISCUSSION

The findings of this study highlight how SRL-resilience strategies help students in developing countries overcome technological, psychological, and contextual challenges in e-learning. Students use SRL strategies, such as goal-setting, time management, and self-monitoring, alongside peer-led initiatives and low-tech solutions, to actively manage barriers rather than passively cope with them. This active

[62] Zimmerman, "Dimensions of Academic Self-Regulation."
[63] Lai and Hwang, "Strategies for Enhancing Self-Regulation in e-Learning: A Review of Selected Journal Publications from 2010 to 2020."

engagement challenges the common view of students in low-resource settings as mere victims of technological constraints.

Technological Resilience Strategies

Technological barriers, such as unreliable internet and limited access to devices, align with previous research on e-learning challenges in developing countries.[64] However, this study reveals that students actively manage these constraints, such as downloading resources off-peak (e.g., S1's practice), which reflects a high level of self-regulation. Although smartphones are used, their limitations, such as difficulty engaging with video lectures, highlight ongoing concerns about digital inequity and the need for further research into the long-term impact of these adaptations on academic outcomes.

Psychological and Emotional Resilience Strategies

Psychological challenges like isolation are well-documented.[65] The current study reveals that students use goal-setting and personalised routines to mitigate these challenges. Digital reminders help cultivate psychological resilience, though these strategies may only address symptoms rather than institutional issues like a lack of engagement in e-learning environments. Peer support through platforms like WhatsApp and Facebook mitigates isolation, providing both academic assistance and emotional support, but these informal networks may lack sustainability without institutional backing.

Social Support Resilience Strategies

The creation of peer-led YouTube channels is a novel contribution, showing how students not only regulate their own learning but also support their peers. This collaborative learning approach challenges the traditional view of e-learning as an individualistic activity and suggests it may serve as a strategy for resilience in resource-constrained environments. However, the scalability and institutional integration of such peer-driven initiatives raise concerns about quality and consistency, especially in developing countries where institutional e-learning support may be limited.[66]

SRL Strategies

SRL strategies like goal setting, self-monitoring, and routine creation are vital in helping students manage e-learning. However, their widespread reliance also exposes gaps in institutional e-learning systems, suggesting that educational structures may not provide enough support for effective learning management.[67] Students who engaged in self-reflection and progress reviews exhibited greater autonomy, but the emphasis on SRL also raises concerns about the burden placed on students in environments lacking adequate institutional support.

Novel Contributions and Implications

The peer-led YouTube channels are a significant innovation in SRL and peer support literature, showing how students leverage digital tools to create collaborative learning environments. These initiatives demonstrate resilience and creativity, which align with the views of Singh.[68] However, the informal nature of these initiatives raises concerns about their scalability and the need for institutional support. Integrating peer support systems into formal educational frameworks can address emotional and social well-being gaps, fostering a more collaborative e-learning environment from the outset.

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[64] Mohammad Ali, S.M Khaled Hossain, and Tania Ahmed, "Effectiveness of E-Learning for University Students: Evidence from Bangladesh," *Asian Journal of Empirical Research* 8, no. 10 (November 26, 2018): 352–60, https://doi.org/10.18488/journal.1007/2018.8.10/1007.10.352.360; Zandi, Lahrash, and Shakhim, "Factors Effecting the Adoption of E-Learning: An Empirical Study of Libyan Universities."

[65] Zahid and Basir, "Assessing the Impact of Interactivity on E-Learning Quality: A Quantitative Investigation in Higher Education Institutes of Pakistan."

[66] Bylieva et al., "Self-Regulation in E-Learning Environment"; Bizzo, "Acceptance and Resistance to E-Learning Adoption in Developing Countries: A Literature Review."

[67] Ali, Hossain, and Ahmed, "Effectiveness of E-Learning for University Students: Evidence from Bangladesh"; Choudhury and Kumar, "COVID-19 and Digital Learning in Higher Education in India: Unpacking the Inequity in Students' Experiences."

[68] Amrik Singh, "Impact of E-Learning on Students' Motivation in Higher Education Institutions," *Revista de Educación y Derecho*, no. 29 (April 1, 2024), https://doi.org/10.1344/REYD2024.29.43214.

RECOMMENDATIONS

To enhance the e-learning experience and address the challenges identified in this study, universities should formalise peer-led initiatives, such as YouTube channels and WhatsApp groups, by integrating them into official LMSs and incentivising peer mentors with academic credits or small financial rewards. Digital literacy programmes should be implemented at the start of each semester to equip students, particularly from underserved areas, with the necessary skills to navigate e-learning platforms. Universities should also provide low-bandwidth learning materials optimised for mobile devices to address technological barriers. Time management tools, such as automated scheduling and study reminders, should be incorporated into LMS platforms to help students manage their learning. To mitigate psychological challenges, universities must offer virtual counselling, peer support groups, stress management workshops, and foster social interaction through virtual study groups. Collaborating with telecom providers to offer discounted data packages and establishing device loan schemes will help bridge the digital divide.

Additionally, universities should encourage collaborative learning by promoting group activities and projects on e-learning platforms. SRL strategies, including goal setting and self-reflection, should be supported with workshops to help students manage their time and track their progress. Peer-led content creation should be incentivised to foster a collaborative approach to learning. Furthermore, future quantitative studies should examine the causal relationships between resilience strategies (such as goal setting, time management, and peer support) and academic performance, using experimental or longitudinal designs to understand their direct impact on student achievement. This evidence would provide a solid foundation for integrating resilience-building strategies into e-learning environments and inform future academic practices.

CONCLUSION

The findings of this study highlight the critical role of SRL and resislience in helping students in developing countries navigate the challenges of e-learning. While students use SRL strategies such as goal-setting, time management, and self-monitoring, along with peer-led initiatives like YouTube channels and social media groups, these strategies primarily aim to overcome technological, psychological, and contextual barriers. However, the study reveals that despite the use of these resilience strategies, students' engagement with e-learning platforms remains hindered by resource limitations. The challenges students face point to the need for further institutional support to scale SRL strategies and peer support systems, ensuring their sustainability and effectiveness in e-learning environments.

LIMITATIONS OF THE STUDY

A key limitation of this study is its inability to establish causal relationships, particularly regarding the impact of SRL strategies on academic performance. The research focuses on two universities in South Africa and Mozambique, limiting the generalisability of the findings to other developing countries.

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BIBLIOGRAPHY

Agyekum, Boadi, Waad Ali, and Robert Lawrence Afutu-Kotey. “Continuing Education and Perception of Community Learning Centres: A Case Study of the University of Ghana Community Learning Centres, Ghana.” *Journal of Adult and Continuing Education* 30, no. 1 (May 13, 2024): 193–215. https://doi.org/10.1177/14779714231189617.

Al-Adwan, Ahmad Samed, Muhmmad Nofal, Huma Akram, Nour Awni Albelbisi, and Manaf Al-Okaily. “Towards a Sustainable Adoption of E-Learning Systems: The Role of Self-Directed Learning.” *Journal of Information Technology Education: Research* 21 (2022).

Ali, D. K. “Investigating the Students’ Expectation about the Quality of E-Learning in Pakistan.” *SSRN 4691451*, 2024.

Ali, Mohammad, S.M Khaled Hossain, and Tania Ahmed. “Effectiveness of E-Learning for University

Students: Evidence from Bangladesh." *Asian Journal of Empirical Research* 8, no. 10 (November 26, 2018): 352–60. https://doi.org/10.18488/journal.1007/2018.8.10/1007.10.352.360.

Asad, Muhammad Mujtaba, Nadia Hussain, Maria Wadho, Zahid Hussain Khand, and Prathamesh P. Churi. "Integration of E-Learning Technologies for Interactive Teaching and Learning Process: An Empirical Study on Higher Education Institutes of Pakistan." *Journal of Applied Research in Higher Education* 13, no. 3 (June 7, 2021): 649–63. https://doi.org/10.1108/JARHE-04-2020-0103.

Bizzo, Eduardo. "Acceptance and Resistance to E-Learning Adoption in Developing Countries: A Literature Review." *Ensaio: Avaliação e Políticas Públicas Em Educação* 30, no. 115 (June 2022): 458–83. https://doi.org/10.1590/s0104-403620220003003342.

Boateng, Richard, Alfred Sekyere Mbrokoh, Lovia Boateng, Prince Kwame Senyo, and Eric Ansong. "Determinants of E-Learning Adoption among Students of Developing Countries." *The International Journal of Information and Learning Technology* 33, no. 4 (August 1, 2016): 248–62. https://doi.org/10.1108/IJILT-02-2016-0008.

Bylieva, Daria, Jon-Chao Hong, Victoria Lobatyuk, and Tatiana Nam. "Self-Regulation in E-Learning Environment." *Education Sciences* 11, no. 12 (December 2, 2021): 785. https://doi.org/10.3390/educsci11120785.

Choudhury, Pradeep Kumar, and Amit Kumar. "COVID-19 and Digital Learning in Higher Education in India: Unpacking the Inequity in Students' Experiences." In *The Evolving Landscape of Higher Education in India*, 121–35. Singapore: Springer Nature Singapore, 2024. https://doi.org/10.1007/978-981-97-9270-2_9.

Clarke, Victoria, and Virginia Braun. "Thematic Analysis." In *Encyclopedia of Critical Psychology*, 1947–52. Springer, 2014.

Coe, Robert, Michael Waring, Larry V Hedges, and Laura Day Ashley. *Research Methods and Methodologies in Education*. SAGE Publications Limited, 2025.

Creswell, J. W., and C. N. Poth. *Qualitative Inquiry and Research Design: Choosing among Five Approaches* . SAGE Publications, 2018.

Dejene, Wondifraw, and Dagmawit Tilahun. "How Ready Are Our Students for E-Learning? Evidence from Ethiopia." *Discover Education* 3, no. 1 (December 20, 2024): 283. https://doi.org/10.1007/s44217-024-00359-5.

Eze, Sunday C., Vera C. A. Chinedu-Eze, Clinton K. Okike, and Adenike O. Bello. "Factors Influencing the Use of E-Learning Facilities by Students in a Private Higher Education Institution (HEI) in a Developing Economy." *Humanities and Social Sciences Communications* 7, no. 1 (October 27, 2020): 133. https://doi.org/10.1057/s41599-020-00624-6.

Henrietta, H Mary. "Exploring the Evolution and Implications of E-Learning Ecosystems." In *Pedagogical Revelations and Emerging Trends*, 144–47. CRC Press, 2025.

Kekana, Tebogo, and M J Mogoboya. "Factors That Impact on E-Learning in a Selected South African University: A Pedagogical Perspective." *Special Education* 2, no. 43 (2022).

Kibuku, Rachael Njeri, Prof. Daniel Orwa Ochieng, and Prof. Agnes Nduku Wausi. "E-Learning Challenges Faced by Universities in Kenya: A Literature Review." *Electronic Journal of E-Learning* 18, no. 2 (February 1, 2020). https://doi.org/10.34190/EJEL.20.18.2.004.

Lai, Chiu-Lin, and Gwo-Jen Hwang. "Strategies for Enhancing Self-Regulation in e-Learning: A Review of Selected Journal Publications from 2010 to 2020." *Interactive Learning Environments* 31, no. 6 (August 18, 2023): 3757–79. https://doi.org/10.1080/10494820.2021.1943455.

Letsoalo, M. E., and T. P. Makgakga. "Exploring Pre-Service Mathematics Students' Videoconferencing Experiences: A Case of Open and Distance e-Learning in South Africa." *African Perspectives of Research in Teaching and Learning*, 2024. https://doi.org/10.70875/v8i2article16.

Looi, Kim Hoe. "Determinants of Future Preference for E-Learning and Its Implications: A Study of Malaysian Business Students." *Issues in Educational Research* 31, no. 3 (2021): 914–29.

Madni, Syed Hamid Hussain, Javed Ali, Hafiz Ali Husnain, Maidul Hasan Masum, Saad Mustafa, Junaid Shuja, Mohammed Maray, and Samira Hosseini. "Factors Influencing the Adoption of IoT

for E-Learning in Higher Educational Institutes in Developing Countries." *Frontiers in Psychology* 13 (July 8, 2022). https://doi.org/10.3389/fpsyg.2022.915596.

Mahaluça, Filipe, Carla Moiana, Júlio Macuacua, and Valentim Macuacua. "Innovation in the Teaching-Learning Process in Higher Education in COVID-19 Time in Mozambique." *J Huma Soci Scie 5 (1): 01* 5 (2021).

Maisha, Kashfia, and Sabakun Naher Shetu. "Influencing Factors of E-Learning Adoption amongst Students in a Developing Country: The Post-Pandemic Scenario in Bangladesh." *Future Business Journal* 9, no. 1 (August 15, 2023): 37. https://doi.org/10.1186/s43093-023-00214-3.

Martins, Helio Rogerio, Iolanda Cavaleiro Tinga, Jose Luis Manjate, Lenia Cecilia Sitoe, and Ana Paula Xavier Matusse. "Online Learning during COVID-19 Emergency-a Descriptive Study of University Students' Experience in Mozambique." *Journal of Applied Learning & Teaching* 4, no. 1 (2021): 29–37.

Masten, Ann S. "Multisystem Resilience: Pathways To An Integrated Framework." *Research in Human Development* 18, no. 3 (July 3, 2021): 153–63. https://doi.org/10.1080/15427609.2021.1958604.

———. "Pathways to Integrated Resilience Science." *Psychological Inquiry* 26, no. 2 (April 3, 2015): 187–96. https://doi.org/10.1080/1047840X.2015.1012041.

Masten, Ann S, Kayla M Nelson, and Sarah Gillespie. "Resilience and Student Engagement: Promotive and Protective Processes in Schools." In *Handbook of Research on Student Engagement*, 239–55. Springer, 2022.

Mayan, M. J. *Essentials of Qualitative Inquiry*. Taylor & Francis, 2023.

Merola, Rachael H. "Online Learning's Potential to Improve Access and Quality in Higher Education in Mexico: Perspectives of Higher Education Stakeholders." *Journal of Education and E-Learning Research* 12, no. 1 (February 25, 2025): 94–103. https://doi.org/10.20448/jeelr.v12i1.6448.

Molokwane, R M S, and Luther-King Junior Zogli. "Perceptions of First-Year Students from Disadvantaged Backgrounds of e-Learning at the Durban University of Technology, South Africa." *Progressio* 42 (2021): 17-pages.

Moser, Albine, and Irene Korstjens. "Series: Practical Guidance to Qualitative Research. Part 3: Sampling, Data Collection and Analysis." *European Journal of General Practice* 24, no. 1 (January 1, 2018): 9–18. https://doi.org/10.1080/13814788.2017.1375091.

Mugizi, Wilson, and Judith Irene Nagasha. "E-Learning." *Conceptualizations of Africa: Perspectives from Sciences and Humanities*, 2025, 143–63.

Mushtaq, Maila, Aster Noor, and Nosheen Sabahat. "Adoption Barriers of E-Learning in Heigher Education Institutes (HEI's) of Developing Countries - A Systematic Literature Review." In *2021 International Conference on Innovative Computing (ICIC)*, 1–8. IEEE, 2021. https://doi.org/10.1109/ICIC53490.2021.9693081.

Phutela, Nidhi, and Sunita Dwivedi. "A Qualitative Study of Students' Perspective on e-Learning Adoption in India." *Journal of Applied Research in Higher Education* 12, no. 4 (March 14, 2020): 545–59. https://doi.org/10.1108/JARHE-02-2019-0041.

Qazi, Muhammad Arsam, Muhammad Aiyaz Sharif, and Ather Akhlaq. "Barriers and Facilitators to Adoption of E-Learning in Higher Education Institutions of Pakistan during COVID-19: Perspectives from an Emerging Economy." *Journal of Science and Technology Policy Management* 15, no. 1 (January 2, 2024): 31–52. https://doi.org/10.1108/JSTPM-01-2022-0002.

Rachmad, Yoesoep Edhie. "Educational Resilience Theory." Ravenna Mosaici Libri Internazionali, 2022.

Rhongo, Domingos Luis, and Bonifacio da Piedade. "E-Student in the Mozambican Context: An Analysis of Higher Education Students' Challenges Regarding to E-Learning Implementation," 343–54, 2024. https://doi.org/10.1007/978-3-031-51979-6_36.

Salite, Maria, Ana Paula Afonso, and Lina Morgado. "Models And Practices Of Elearning Use At The Catholic University Of Mozambique: A Case Study," 3964–73, 2022. https://doi.org/10.21125/iceri.2022.0964.

Schunk, Dale H., and Barry J. Zimmerman. "Self-Regulation and Learning." In *Handbook of Psychology*, 59–78. Wiley, 2003. https://doi.org/10.1002/0471264385.wei0704.

Schunk, Dale H, and Barry J Zimmerman. "Self-Regulation in Education: Retrospect and Prospect." In *Self-Regulation of Learning and Performance*, 305–14. Routledge, 2023.

Sims, Danica Anne. "Online Education and Learning Management System Usage in a South African Economic and Management Faculty during COVID-19." *E-Learning and Digital Media* 22, no. 5 (2025): 465–83.

Singh, Amrik. "Impact of E-Learning on Students' Motivation in Higher Education Institutions." *Revista de Educación y Derecho*, no. 29 (April 1, 2024). https://doi.org/10.1344/REYD2024.29.43214.

Tisdell, Elizabeth J, Sharan B Merriam, and Heather L Stuckey-Peyrot. *Qualitative Research: A Guide to Design and Implementation*. John Wiley & Sons, 2025.

Tracy, Sarah J. *Qualitative Research Methods: Collecting Evidence, Crafting Analysis, Communicating Impact*. John Wiley & Sons, 2024.

Valencia-Arias, Alejandro, Salim Chalela-Naffah, and Jonathan Bermúdez-Hernández. "A Proposed Model of E-Learning Tools Acceptance among University Students in Developing Countries." *Education and Information Technologies* 24, no. 2 (March 27, 2019): 1057–71. https://doi.org/10.1007/s10639-018-9815-2.

Wema, Evans F. "Developing Information Literacy Courses for Students through Virtual Learning Environments in Tanzania: Prospects and Challenges." *IFLA Journal* 47, no. 4 (2021): 559–69.

Woldegiorgis, Emnet Tadesse, and Otilia Chiramba. "Access and Success in Higher Education: Fostering Resilience in Historically Disadvantaged Students in South Africa." *Journal of Applied Research in Higher Education* 17, no. 2 (2025): 759–71.

Yakobi, Khulekani, Siphokazi Yakobi, Godwin Kaisara, and Sulaiman Olusegun Atiku. "The Challenges and Opportunities of E-Learning in an Emerging University in South Africa." *International Journal of Education and Development Using Information and Communication Technology* 21, no. 1 (2025): 1–15.

Zahid, ZUNAIRA, and M Basir. "Assessing the Impact of Interactivity on E-Learning Quality: A Quantitative Investigation in Higher Education Institutes of Pakistan." *Psychology and Education* 58, no. 3 (2021): 3132–45.

Zandi, GholamReza, Husam A E Lahrash, and Fadya Ramadan Shakhim. "Factors Effecting the Adoption of E-Learning: An Empirical Study of Libyan Universities." *Journal of Information Technology Management* 14, no. 4 (2022): 95–117.

Zimmerman, Barry J. "Becoming a Self-Regulated Learner: An Overview." *Theory Into Practice* 41, no. 2 (May 2002): 64–70. https://doi.org/10.1207/s15430421tip4102_2.

———. "Dimensions of Academic Self-Regulation." In *Self-Regulation of Learning and Performance*, 3–21. New York: Routledge, 2022.https://doi.org/10.4324/9780203763353-1.

Zimmerman, Barry J. "Dimensions of Academic Self-Regulation: A Conceptual Framework for Education." In *Self-Regulation of Learning and Performance*, 3–21. Routledge, 2023.

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