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THE TRANSITION TO REMOTE TEACHING AND LEARNING FOR ENGINEERING STUDENTS AT A HIGHER LEARNING INSTITUTION, KWAZULU-NATAL PROVINCE

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Abstract

After the scourge of the COVID-19 pandemic globally, with its devastating social and economic impact and implications. The transition to blended learning as opposed to the only face-to-face pivot was a reality and a norm. The higher education sector was also not spurred into the adoption of blended and remote teaching and learning was an existential reality. This sudden and accelerated shift to remote online learning could now be attributed as the major feature within the higher learning community of practice in South Africa by the Department of Higher Education and Training as Remote Teaching and Learning (RTL). Using a qualitative research methodology, the study is exploring and evaluating its impact and implications within the engineering program and curriculum delivery with RTL at its core. Fifteen participants utilised unstructured, open-ended, online interviews. The key study findings illuminated both the internal and external factors that have impacted the learners' transition to the RTL and discovered that with a dedicated and bespoke digital-oriented problem solution and decision making, the challenges and constraints could be managed and contingencies implemented. Additionally, the resources and capabilities within the contingency-oriented execution could mitigate some complex socio-economic challenges for the prosperous benefit of the learners who are the future ambassadors of any society.

Keywords: blended learning, remote teaching learning, technological adoption

1. Introduction

The era of the Fourth Industrial Revolution and the current permeation of Artificial Intelligence have fast-tracked the pivot of many sectors to the reality of the virtual systems of interaction within the organisational and constitutional context. The higher learning institution has not been an exception, considering the recent catastrophic game-changing impact brought by the COVID-19 pandemic that adversely affected both the livelihoods and the economic well-being of diverse societies. The transition to digitalization inclined knowledge dissemination to the learners, also received critical attention and focus from the policy-makers and decision-makers who facilitated the digital assets and tools while taking cognizance of social disparities and the empowerment of direct pedagogical stakeholders in their pursuit of recovery and restoration in quality delivery (Tilak & Kumarm, 2022).

Therefore, remote teaching and learning (RTL) have become the contemporary norm that higher learning institutions and their broader stakeholders have to grapple with. According to Singh, Steele & Singh (2021), the challenges of the transition warranted overcoming hindrances such as social dynamics, teaching and learning dynamics, and cognitive-oriented dynamics within the context of e-Learning techniques and tools. Contextualising the epistemic and ontological premise of the pedagogical and academic sector into this new normalcy form, both the societal and economic context, this has weighed heavily on the students' practical experience as virtual teaching and learning methods were adopted (Shehadeh, 2020). The transition from conventional face-to-face (F2F) teaching and learning academic deliverables to RTL brought challenges, opportunities and a paradigmatic shift not only to the learners but also to the educators alike within the broader pedagogical context. This illuminated the gap between Global South and High-income economies with specific reference to the ICT-oriented

infrastructure, resources, and capabilities for the decision makers and policy makers, more so in terms of ICT (Affouneh, Salha & Khlaif, 2020).

The South African higher learning ecosystem is complex, with explicit and tangible inequalities, specifically pertaining to the students from the Bottom of the Pyramid social strata, and some less endowed in terms of amenities, geographical regions such as semi-urban and rural areas (Bozkurt & Sharma, 2020). Additionally, Aloka's (2022) study revealed that both male and female learners experience challenges and have the fear of the unknown syndrome in adjusting to the university's way of social and economic living. This discourse was echoed within the learners' resilience perspective, which attempted to leverage the learning outcomes and assimilation specifically while acquiring the pedagogical content from home (Ramadhana et al., 2021). The students' social experiences as growing adults with their newfound freedom from closely guarded parental grip and the attendance culture in their previous pedagogical acquisition fold have to be substituted by either the hybrid or the RTL learning for their prosperity (Govindarajan & Srivastava, 2020). The demographic and psychographic backgrounds of these students also play a critical role in terms of the skewed socio-analytical contours of the society which grapples with high unemployment, poverty, escalating crime levels, substance abuse and gender based oriented violence (Serpa & Ferreira, 2019).

From the macro-analytical lenses, there has been a wholesale adjustment in the strategies, contingency plans, processes, procedures and value chain that the academic institutions, with more specificity to the universities, in their programs, disciplines, and syllabi, are being transacted or facilitated by educators and relatable manner that they are acquired and assimilated by the learners in general (Tanga, Ndhlovu & Tanga, 2020). Barbour *et al.* (2020) elucidate that the meaning of the expression “remote teaching and learning -RTL” has varying connotations compared to that of “online learning” since its resourceful virtual learning practice is intensely in contrast to modules disseminated, delivered and facilitated in an online platform. It is the assertion of Barbour *et al.* (2020) that the integrity of teaching and learning is influenced by the techniques utilised and the thorough appreciation of diverse yet compatible design categories. The scourge of the digital divide warranted a fine-tooth comb navigation from the authorities in an attempt to reduce the resource imbalance risk, which characterized the socio-economic imbalances that the learners are confronted with from the social capital context (Faloye & Ajayi, 2022).In order for the continuous strategic and contingency adjustment to the sustainable and cost-effective transition in an agile and systems thinking aptitude that is able to capture positive learner experience, agility, resilience, and recovery on the existential and contemporary virtual education delivery was the new norm (Mohamed Hashim et al., 2022).

Intellectually engaging and reflecting with online learning is the outcome of impeccable instructional design and planning emanating from and anchored on a methodical approach. The study configured the following objectives as the primary aim of realizing the exploration of learners into the RTL mode of academic delivery. The objective of the study was: -

- To explore the degree to which the transformation to the RTL mode of teaching and learning delivery could be comprehended and assimilated by learners.
- To assess the impact level of adaptability and agility of students in adjusting to the digitally oriented RTL.
- To examine the learner success propensity within the RTL delivery mode, predicated on RTL.

2. Literature Review

The socio-cultural situation analysis of learners in the context of demographic and psychographic context

The South African higher learning pedagogical and academic landscape has been experiencing a plethora of challenges, given the unequal social dynamics in the country that are mainly expressed by the current levels of unemployment, poverty and income inequality. Carniel *et al (2023) postulated that the experiences and perceptions within the dynamics of mitigating resistance to change by fostering new ways of curriculum emancipation within the epistemic pedagogy should also inculcate sensitive socio-economic realities, such as decolonization, as* another viable option.

This has been evidenced by the groundswell in the students' socio-political activism and resistance that culminated in the rhetoric and slogan, namely *hashtag (#) FeesMustFall*, which explicitly translates into the declaration that higher learning fees are simply not affordable (Nomvete & Mashayamombe, 2019). The policy-makers and authorities then took a strategic decision that the socio-cultural challenges of the deserving students should not be a constraint for acquiring tertiary education, and hence the cost of higher learning was declared free for those students who are socially in the designated Bottom of the Pyramid (BoP) in the social capital echelons. The other catalyst that presented a headwind for the policy-makers and the authorities was the adjustment and the transition to virtual learning platforms as a result of the COVID-19 pandemic, which almost shut down the entire universe while dealing with the mitigating measures of the pandemic (Mohmmed et al.,

2020). When the outbreak occurred in the last quarter of 2019, the contagion in the form of a virus, which had devastating consequences globally, was proclaimed a once-in-a-century worldwide pandemic (World Health Organization, 2022). The related jeopardy in the country, such as South Africa, was the low productivity and economic growth rate that was so sluggish that the unemployment levels also increased, which has been occurring for quite some time now, as evidenced by the statistical figures by the South African Reserve Bank (SARB, 2022). This economic growth regression is the result of a revised increase of 1.4% in the fourth quarter of 2021, while in the ensuing quarter it was recorded as less than 1%. While the country has made massive strides in learner support and assistance by the state, such as the NSAFS (National Student Aid Financial Aid Scheme), which has opened the doors of higher learning for so many students who would have been deprived, it is another step forward on the learner prosperity perspective (Chiramba, O., & Ndofirepi, 2023). Therefore, the then imminent school and university's discontinuation as an emergency intervention has also contributed to the documented escalation in inequalities within the pedagogical and academic landscape while decimating the hopes and aspirations of vulnerable children and youth unreasonably (Lawson, 2021; UNESCO, 2022).

The social bedrock of the higher learning stakeholder community has been digitally disrupted, with the contemporary strategic intervention by the decision makers by pivoting into RTL, which presented hindrances and opportunities. A comprehensive reflection after the year 2000 publications illustrates how educators and learners construe RTL, while pondering on probabilities and likelihoods in alleviating anxiety and uncertainty pressures or dissatisfaction with synchronous Tsai et al. (2020). While there is a notable latitude of flexibility and time management cushion as a result of less travelling to and from lecture theatres, and the newfound liberty to remotely work at your personal velocity as a student. Learning agility also facilitates the freedom on the part of the educators to be proactive and adjust in their teaching and learning planning, for instance, cascading into the learners enjoying the digital storage, such as those emanating from recorded lessons (Tsai *et al*., 2020).

Remote learning is unique in the delivery aspect from online learning. Bate (2021) maintains that online learning is more than merely a system of dissemination, which could be categorized as a form of remote learning delivery in which the discipline or the module content in particular is framed by espousing the holistic online delivery. Furthermore, the module outline guidelines with the teaching and learning components, such as attendance, assessment, referencing, moderation, learner-centricity, and participation, utilize bespoke pedagogical systems and procedures custom-made to online learning. Hodges *et al*. (2020) corroborate this assertion by reiterating the notion that the existential circumstance, which could be inferred as the brief adjustment in the mannerism of such teaching and learning delivery and acquisition, conforms to the learner's expectations. The study revealed that blended learning could be stifled and constrained by an avalanche of obstacles in South Africa, which is characterized by the digital divide, obfuscation and sluggish investment prioritization in digitalization through research & development, family skewed resources and ICT skills deficit, thus requiring an innovation policy shift that embraces e-commerce and its wide digitalization culture spectrum (Mhlanga, 2021). The RTL, with its heavy reliance on internet access and the persistent energy interruptions referred to as loadshedding, has also thrown a spanner into the works, as it disrupts the RTL's effectiveness, specifically in the context of vulnerable learners who might not have alternative sources of energy during such disruptions.

2.1 Theoretical Perspective

2.1.1 Technology acceptance model (TAM)

Davis (1989) is a pioneer of the Technology Acceptance Model (TAM). The s u b - theory anchoring TAM is the theory of reasoned action, which provides building blocks for TAM evolution. Two metrics of technological acceptance, perceived utility and perceived convenience of use, therefore cushioned TRA's attitude toward a particular action. The model's key features accentuate the interpretations of the envisioned user within the ICT context. Technology is only embraced and assimilated if both users and its inventors concur that it has tailwinds and tangible added benefits (Charness & Walter, 2016). TAM, with its existential ubiquity, is described as one of the models with significant influence on how people adopt novel technology within its intentionality prospects, while utilizing such systems, processes, and applications to the phenomenon at hand and their discernment of its intrinsic value (Emon, 2023).

The extension of TAM could also be contextualized within the information systems theory, also conceptualized as "technology acceptance theory", which elucidates how learners, for instance, come to adopt, embrace and utilize technology (Zaineldeen et al., 2020). Adoption, authentication, and broadening are the three phases that TAM progression takes into consideration. It was assessed and espoused throughout the assimilation stage through a significant number of phases of information system dimensionality. Researchers came to the realization that TAM explicitly and expressly appraises users' acceptance actions for diverse technologies,

specifically during the validation phase. The incrementality of the final phase presented to the researchers a plethora of additional and novelty-oriented variables, while new linkages between the TAM's structures could also be observed (Momani & Jamous, 2020).

3. Methodology

The qualitative methodology that is predicted in inductive-oriented interpretivist philosophy guided both the epistemic and ontological conceptualisation of the study (Creswell & Creswell, 2018). The interpretivism philosophy has augmented gravitas in extracting nuanced and insightful meaning from participants' experience and wisdom, sensitive towards individual meanings and contributions (Alharahsheh & Pius, 2020). This allowed the deeper and more probing insights of the participants ' experience and know-how in the explication of the RTL phenomenon that the study is exploring for rich and hard data extrapolation. The participants' demographic and psychographic idiosyncrasies recruited the engineering and land survey students as the inclusive criteria to participate in the study.

The population of the study was the final year students who will soon be eligible for the Work-Integrated Learning opportunities in their pursuit of labour market absorption and development of their careers (Mandal & Edwards, 2022). A total of fifteen (15) engineering and land surveying students participated in the study, and the researchers are eternally grateful for their research input. The study pursued the purposive sampling technique that facilitated the deeper meaning of the participant data collection in an effective and trustworthy alignment effort (Nyimbili & Nyimbili, 2024). Data collection instruments with unstructured questions facilitated the collection of uncontrived data from the participating learners (Saunders & Thornhill, 2019). The ethical protocols, including informed consent adherence, anonymity and confidentiality of the participants, were observed at all times. Data quality was also a priority for the researchers in the entire data collection process and procedure. The consideration of the ethics review committee (ERC) approval to undertake such research within the social science research discipline provides assurance of the study participants' anonymity, confidentiality and informed consent, as well as the mitigation of any participant's violation in the data collection protocol process (Carniel et al., 2023).

Findings

P01: *"Most of the encounters I experienced were as a result of not having internet connectivity interruptions due to power or electricity outages that is normally termed as loadsheding in South Africa as ESKOM who is the national energy supply is going through reliability of supply uncertainties nationally and this has been some time now, if I am not mistaken it is more than a decade long."*

P01 also added: '*There is also a culture of illegal connectivity in our area, which is categorised as semi-urban dwelling as it is under the traditional leadership precinct as opposed to municipal or metropolitan designation, which usually enjoys more socio-economic inclined amenities compared to us."*

P07: *"The inconsistent sporadic network connectivity challenges are a grave cause for concern on most occasions when one is making an attempt to access internet connectivity.*

Most probably, this is offset by the recording of lecture materials that one could access at a later stage. The notable disadvantage is that though this lacks the active and pragmatic participation and indulgence in the pedagogical matter in real-time for us as students."

P09: *"The constraint could be classified as rather inefficiencies that are in our areas of dwelling as a result of poor infrastructure planning, since the electricians believe that the energy transformers are over-capacity utilised due to added connections into the energy grid in our area."*

P11 stated that "I had on numerous occasions experienced internet network glitches when undertaking RTL participation at the stipulated times in our faculty, while other students did not encounter similar access to the institution's LMS webpage (Moodle/Learn)."

P11 continued:" So, the disconnection seemed to be geographic specific and dependent on the overall infrastructure suitability of our area, which is in the township as opposed to the suburban social surroundings."

P13 explained: "In terms of handling and managing the online learning, it is better to go to the community library and access a quieter and more education-friendly space, and the connectivity has fewer glitches as they have solar panels to power their energy supply and internet connectivity."

P03 and P04 corroborated similar sentiments of being able to hear the lecturers clearly and participate effectively.

P03 *"Yes, when one is trying to log in to the system and follow, hear and follow the lecturer's presentation, devoid of any problems, many times."*

P04 *"While one is glued to the class proceedings, what concerns me is that it's a bit problematic to keep pace with the contributions from other students in the chat box while simultaneously the class is unfolding on the screen."*

P05 explained that while they are focused on the class deliverables, they have encountered complications interrelating with the rest of the attendees, possibly because the facilitator is concentrating on the slides being presented.

P05 *"It appears that the audibility is not an issue at all for me, coupled with persistent comprehension of what is presented real-time, but interacting with the class is dissimilar compared to the F2F learning scenario.".*

P06 and P10 shared diverse insights and maintained that:

P06 *"I think the facilities that are being used in the RTL are currently not geared up for the effective and transparent engagement that is intellectually stimulating and encouraging live participation on our part as learners."*

P06 added "Laptop *affordability is an issue as one has to rely on mobile gadgets or devices that have storage capacity constraints, which also have constant social media interaction while the lecture is underway."*

P10 *"From my exposure to RTL, while the execution is not seamless, I am optimistic that the semester and the entire academic year will be salvaged and thus succeed under the challenging circumstances as the transition warrants an extra effort from both the educators and us as learners."*

Several Participants complement the strategic intervention of the decision makers in pivoting to RTL in a high velocity as a significant alternative that should be applauded and amplified in terms of students being afforded the learning continuation with the current participation in virtual pedagogical and academic delivery, and further opined that:

P01: *"Living with a large next of kin in an informal dwelling could be disadvantageous to my studies, but one has to have resilience and see the light at the end of the tunnel, given the distorted social reality in our communities."*

P02: *"My mentors always reiterated that no pain, no gain, and this is my mantra to take me through the RTL, no matter what, no retreat, no surrender, adaptability and agility in the virtue."*

P04: *"As a young parent who has a second chance at the educational window of opportunities and residing with my next of kin, I have to be emotionally strong and soldier on with the advent of RTL. I am grateful and pray that I will see this transition through the end of my studies so that I can eventually provide for my family, who have stood by me through thick and thin."*

P10: *"My take is that the environment at home was not conducive at all for studying, because I live at a commune, so the circumstances are definitely not favourable, but I have to make the best out of the adverse situation."*

P12 inferred that: *"There are learners who are normally disorderly as they have more time at their disposal compared to us, who are in the engineering stream, while this has its own weaknesses, but we will keep on trying."*

P06 "My digital and *computer savvy, which originates from my high school days, has helped me in seamless adjustment and handling of demands and adaptation to RTL, which will be a massive push and drive in the successful completion of my degree."*

P03 shared the same sentiments as the above 06P and said, "I have relatively appropriate computer skills, which I learned in earlier high school classes, which have also assisted my cushioning to RTL to have miscue glitches, and I sometimes mentor my co-students when they are confronted with challenges I could solve on their behalf.

P10 echoed that *"Lucky enough*, the exposure to the digital world is hassle-free, and I am enjoying it, which makes it much easier to handle and manage digital resources. I am currently working across the *clock to increase my competency in LMS-oriented software, such as MS Teams and Zoom, but all in all, practice makes perfect."*

P14 emphasized: "*The fast paced peed within which the policy-makers and the authorities diverted to the RTL since the days of COVID -19 right up until now as the appropriate manner to respond to adversity as these technological and digital interventions will eventually even lower the prices of higher learning education to lesser affording families who cannot afford to take their children to university due to social income equalities ravaging our social contours."*

Discussion and Conclusion

The technological and digital capital inequality and divide within the social context is an existential reality, and thus the comprehensive improvement in access to the internet infrastructure resource by the policy makers and educational authorities, specifically to the historically under-resourced and underserved areas, could be regarded as a top strategic priority (Afzal et al., 2023). According to Fabriz, Mendzheritskaya and Stehle (2021), blended learning is an interaction between how the learners cooperate with each other, the educator, and the supporting personnel within the broader educational stakeholders. Furthermore, insufficient network access and the lack of

suitability within the ICT resources are some of the constraints that are confronting the learners, thus impeding their participation in online learning (Bate, 2021).

The fundamental transition in the adoption of the RTL could no longer be categorized as an incremental feature but a fundamental intervention with its mitigation impact and implications affecting all the academic primary stakeholders. The key challenges were associated with both the external and internal dimensionality that require a strategic and problem-solving oriented decision making within the high velocity context and perspective. The study environment that is learner-centric should promote the learners to enable them to focus on their pedagogical and academic tasks since it mitigates distractions and offers a pro-learning culture and ethos, thus allowing the learners to reach their full potential (Fabriz *et al*.,2021). The environment in which students learn and study has an impact on their teaching and learning, and other academic or pedagogical expectations and is associated with success in their studies (Kadir *et al*., 2022). The study found that most participants who indicated that they experience constraints and limitations at home revealed that they had to adapt their daily chores, and/or move from their homes to residences, where the internet and electricity reliability were more uninterrupted and consistent.

The digital literacy and preparedness of learners to assimilate and adjust to computers, information, and internet literacy is a necessary skill nowadays, which has also been accelerated by the ever-present accessibility on ITC devices and gadgets (Audrin & Audrin, 2022). In comparison, the role of the adequacy of network sufficiency coverage plays a critical role as every activity in RTL requires digital and technology savvy (Bokolo et al., 2019). The findings indicated that participants had sufficient digital capabilities and skills to participate efficiently and effectively in RTL. The digital transformational integration and concomitant advancement also facilitate the assimilation of graduated seamless into the working environment, which augurs well for the pedagogical contributions pertaining to acquired skills and competencies for jobs of the future (Alenez, 2023). The findings further illustrated that there was bespoke and dedicated support from ICT personnel and management, where learners had access to systems remotely, which was not the case prior to the institution-wide transition. Additionally, the findings exhibit that the lack of suitable network coverage or connectivity disruptions originated from the unavailability of electricity (load shedding) or internet connectivity challenges when they are at home or in their residence. This adversely affected them immensely, as some skipped lectures, but due to the recorded storage facility in the Moodle platform LMS, the challenge could be of a diminished nature. While reviewing engineering learners' capability and adaptation to actively participate effectively in RTL, it was discovered that engineering learners are confronted with numerous constraints that require management and contingency intervention. Such as access to pedagogical and academic materials, effective interconnection and participation during RTL sessions and a non-conductive home environment which hampers effective participation in RTL. In order to comprehensively deal with these concerns, in a pragmatic and solution-driven manner within the digitalized and technologically astute demeanor, the researchers recommend that the said institution ensure that engineering learners have sufficient and adequate access to the internet and data availability, whether inside or outside the institution's premises. In order for the learners to be able to access study material on time, they need to interact and participate effectively in RTL and all engineering learners who do not have a conducive environment at home be accommodated in spaces such as municipality demarcated areas, like libraries in their communities or to residences as and when the need arises in a systemically planned and seamlessly orchestrated manner.

References

Alharahsheh, H. H., & Pius, A. (2020). A review of key paradigms: Positivism VS interpretivism. *Global academic journal of humanities and social sciences*, *2*(3), 39-43. https://gajrc.com/gajhss

Audrin, C., & Audrin, B. (2022). Key factors in digital literacy in learning and education: a systematic literature review using text mining. *Education and Information Technologies*, *27*(6), 7395-7419. http://dx.doi.org/10.1007/s10639-021-10832-5

Affouneh, S., Salha, S., & Khlaif, Z. (2020). Designing Quality E-Learning Environments for Emergency Remote Teaching in the Coronavirus Crisis. *Interdisciplinary Journal of Virtual Learning in Medical Sciences, 11*(2), 135 – 137. http://dx.doi.org/10.30476/ijvlms.2020.86120.1033

Afzal, A., Khan, S., Daud, S., Ahmad, Z., & Butt, A. (2023). Addressing the digital divide: Access and use of technology in education. *Journal of Social Sciences Review*, *3*(2), 883-895. http://dx.doi.org/10.54183/jssr.v3i2.326

Aloka, P. J. (2023). Academic resilience as predictor of academic adjustment among freshmen in distance learning programme at one public university. *Social Sciences and Education Research Review*, *10*(1), 151-161. http://dx.doi.org/10.5281/zenodo.8151109

Barbour, M. K., LaBonte, R., Hodges, C. B., Moore, S., Lockee, B. B., Trust, T., ... & Kelly, K. (2020). Understanding pandemic pedagogy: Differences between emergency remote, remote, and online teaching. http://dx.doi.org/10.13140/RG.2.2.31848.70401

Bate, P. (2021). The impact of the COVID-19 pandemic on current tertiary aviation education and future careers: Students' perspective. *Journal of Air Transport Management, 94*(4), 1-8. http://dx.doi.org/10.1016/j.jairtraman.2021.102081

Bokolo, A., Adzhar, K., Awanis, R., Anis, F., Danakorn, N., Aziman, A., Suria, B. (2019). Exploring the role of blended learning for teaching and learning effectiveness in institutions of higher learning: An empirical investigation. *Education and Information Technologies, 24*(6), 3433-3466. https://link.springer.com/article/10.1007/s10639-019-09941-z

Bozkurt, A., & Sharma, R. (2020). Emergency remote teaching in a time of global crisis due to the Coronavirus pandemic. *Introduction: Education crisis on a global scale due to the COVID-19 pandemic, 15*(1), 1-6. http://dx.doi.org/10.5281/zenodo.3778083

Carniel, J., Hickey, A., Southey, K., Brömdal, A., Crowley-Cyr, L., Eacersall, D., ... & Pillay, Y. (2023). The ethics review and the humanities and social sciences: disciplinary distinctions in ethics review processes. *Research Ethics*, *19*(2), 139-156. https://doi.org/10.1002/9781119410867.ch3

Charness, N., & Walter, R. (2016). In Handbook of the Psychology of Ageing. *5*(1), 3-13. https://doi.org/10.1016/B978-0-12-411469-2.00020-0

Alenezi, M. (2023). Digital learning and digital institution in higher education. *Education Sciences*, *13*(1), 88. https://doi.org/10.3390/educsci13010088

Chiramba, O., & Ndofirepi, E. S. (2023). Access and success in higher education: Disadvantaged students' lived experiences beyond funding hurdles at a metropolitan South African university. *South African Journal of Higher Education*, *37*(6), 56-75. https://doi.org/10.20853/37-6-6021

Creswell, J., & Creswell, D. (2018). *Research Design: Qualitative, Quantitative and Mixed Methods Approaches* (Fifth ed.). Sage.

Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). Technology acceptance model. *Journal of Management Science*, *35*(8), 982-1003.

Emon, M. M. H. (2023). Insights into technology adoption: a systematic review of framework, variables and items. *Information Management and Computer Science*, *6*(2), 27-33. http://dx.doi.org/10.26480/imcs.02.2023.55.61

Fabriz, S., Mendzheritskaya, J., & Stehle, S. (2021). Impact of synchronous and asynchronous settings of online teaching and learning in higher education on students' learning experience during COVID-19. *Frontiers in psychology*, *12*, 733554. https://doi.org/10.3389/fpsyg.2021.733554

Faloye, S. T., & Ajayi, N. (2022). Understanding the impact of the digital divide on South African students in higher educational institutions. *African Journal of Science, Technology, Innovation and Development*, *14*(7), 1734-1744. https://doi.org/10.1080/20421338.2021.1983118

Govindarajan, V., & Srivastava, A. (2020). What the shift to virtual learning could mean for the future of higher ed. *Harvard business review*, *31*(1), 3-8. https://hbr.org/2020/03/what-the-shift-to-virtual-learning-could-mean-for-the-future-of-higher-ed

Kadir et al. (2022). Conducive Learning Space for Design-Based Students in Open and Distance Learning (ODL) Implementation. *Proceedings of the 2nd International Conference on Design Industries & Creative Culture, 24*(8), 68-89. http://dx.doi.org/10.4108/eai.24-8-2021.2315099

Lawson, J. (2021, February 22). *2021 Global Education Meeting from recovery to accelerating SDG4 progress*. Online - https://www.unesco.org/en/articles/unesco-unicef-who-and-wfp-call-investing-school-health-and-nutrition. Accessed: - 15 June 2025

Mandal, N. K., & Edwards, F. R. (2022). Student work readiness in Australian engineering workplaces through work-integrated learning. *Higher Education, Skills and Work-Based Learning*, *12*(1), 145-161. http://dx.doi.org/10.1108/HESWBL-02-2021-0025

Mhlanga, D. (2021). The fourth industrial revolution and COVID-19 pandemic in South Africa: The opportunities and challenges of introducing blended learning in education. *Journal of African Education*, *2*(2), 15. http://dx.doi.org/10.31920/2633-2930/2021/v2n2a1

Mohamed Hashim, M. A., Tlemsani, I., & Matthews, R. (2022). Higher education strategy in digital transformation. *Education and information technologies*, *27*(3), 3171-3195. https://doi.org/10.1007/s10639-021-10739-1

Mohmmed et al. (2020). Emergency remote teaching during the Coronavirus pandemic: the current trend and future direction at Middle East College, Oman. *Innovative Infrastructure Solutions, 5*(1), 72-79. http://dx.doi.org/10.1007/s41062-020-00326-7

Momani, A. M. (2020). The unified theory of acceptance and use of technology: A new approach in technology acceptance. *International Journal of Sociotechnology and Knowledge Development (IJSKD)*, *12*(3), 79-98. http://dx.doi.org/10.4018/IJSKD.2020070105

Nomvete, S., & Mashayamombe, J. (2019). South Africa's fees must fall: The case of#UPrising in 2015. *South African Review of Sociology*, *50*(3-4), 75-90.http://dx.doi.org/10.1080/21528586.2019.1699441

Nyimbili, F., & Nyimbili, L. (2024). Types of purposive sampling techniques with their examples and applications in qualitative research studies. http://dx.doi.org/10.37745/bjmas.2022.0419

Ramadhana, M., Putra, A., Pramonojati, T., Haqqu, R., Dirgantara, P., Ismail, O. A., & Wijaksono, D. S. (2021). Learning readiness as a predictor of academic resilience in online learning during school from home. *Library Philosophy and Practice (ejournal)*, *5362*. https://digitalcommons.unl.edu/libphilprac/5362

Saunders, M., & Thornhill, P. L. (2019). *Research Business Methods for Business Studies* (Eighth ed.). United Kingdom: Pearson.

Serpa, S., & Ferreira, C. (2019). Micro, Meso and Macro Levels of Social Analysis. *International Journal of Social Science Studies, 7*(3), 120–122. http://dx.doi.org/10.11114/ijsss.v7i3.4223

Singh, J., Steele, K., & Singh, L. (2021). Combining the best of online and face-to-face learning: Hybrid and blended learning approach for COVID-19, post vaccine, & post-pandemic world. *Journal of Educational Technology Systems*, *50*(2), 140-171. https://doi.org/0.1177/00472395211047865

South African Reserve Bank. Full Quarterly Bulletin, No 304, June 2022. Online: https://www.resbank.co.za/en/home/what-we-do/statistics. Accessed: 05 July 2025.

Tanga, P., Ndhlovu, N., & Tanga, M. (2020). Emergency Remote Teaching and Learning During COVID-19: A recipe for disaster for Social Work Education in the Eastern Cape of South Africa. *African Journal of Social Work, 10*(3), 17-23. http://dx.doi.org/10.26803/ijlter.21.2.10

UNESCO. (2022). *UNESCO, UNICEF and WHO issue considerations for school-related public health measures in the context of COVID-19*. Retrieved from Unicef.org: Online: https://www.unicef.org/turkiye/en/documents/considerations-school-related-public-health-measures-context-covid-19. Accessed: 20 July 2025

Tilak, J. B., & Kumar, A. G. (2022). Policy changes in global higher education: What lessons do we learn from the COVID-19 pandemic? *Higher education policy*, *35*(3), 610. https://doi.org/10.1057/s41307-022-00266-0

Tsai, C. H., Rodriguez, G., Robert, N., Serpi, A., & Caroll, J. (2020). Experiencing the Transition to Remote Teaching and Learning during the COVID-19 Pandemic. *Interaction Design and Architecture(s) Journal, 46*(4), 70 - 87. http://dx.doi.org/10.55612/s-5002-046-004

World Health Organization (WHO). (2022). *Health Topics / Coronavirus disease (COVID-19)*. Retrieved from World Health Organization. Online:https://www.https://www.who.int/health-topics/coronavirus #tab=tab_1. Accessed: 10 May 2025

Zaineldeen, S., Hongbo, L., Koffi, A. L., & Hassan, B. M. A. (2020). Technology acceptance model: concepts, contributions, limitations, and adoption in education. *Universal Journal of Educational Research*, *8*(11), 5061-5071. http://dx.doi.org/10.13189/ujer.2020.081106