THE PERCEPTIONS OF SPEECH-LANGUAGE PATHOLOGY AND AUDIOLOGY STUDENTS TOWARDS ONLINE LEARNING DURING THE COVID-19 PANDEMIC: CONSIDERATIONS FOR THE FUTURE PROFESSORIATE

S. Govender*
https://orcid.org/0000-0002-2219-3451

T. Kyarkanaye*
https://orcid.org/0000-0002-1417-5886

C. Eslick*
https://orcid.org/0000-0003-2297-4466

*Department of Speech-Language Pathology and Audiology
Sefako Makgatho Health Sciences University
Ga-Rankuwa, South Africa

ABSTRACT

The widespread effects of the COVID-19 pandemic in March 2020 led to the suspension of various activities, including education. Institutions responded by shifting to online learning, albeit facing challenges. Student perceptions on online learning are valuable for academic leadership in shaping pedagogies and policies. This study examines Speech-Language Pathology and Audiology students' perceptions (n=43) of online classes during the pandemic. Findings from a descriptive online survey with convenience sampling show that students favoured advantages such as recorded lectures, access to online materials, and self-paced study. However, they highlighted drawbacks like technical issues, limited patient interaction, and reduced engagement with lecturers. Online learning was regarded as effective for enhancing knowledge than for developing clinical skills or social competencies, whilst face-to-face teaching was seen as more effective for fostering clinical skills and social competence compared to online learning. While online learning was initially seen as a response to the pandemic, its formalization as part of a blended education approach in South African universities should align with global trends.

Keywords: COVID-19 pandemic, face-to-face learning, higher education, online learning, perceptions of SLPA students, university

INTRODUCTION

In March 2020, the WHO declared COVID-19 as a health crisis, prompting the closure of educational institutions and affecting over 60 per cent of the world's student population

(Singhal 2020; Adedoyin and Soykan 2020, 1; UNESCO 2020). This disruption necessitated a rapid shift from traditional classroom instruction to online learning methods, highlighting the importance of technology and reliable internet for education continuity (Mohalik and Sahoo 2020, 2; Choi et al. 2021, 20). The shift in pedagogy required active leadership and innovative thinking to reconcile the student, lecturer and their learning experiences within this new environment. The findings of the present study could be useful for the future and current professoriate as they charter the way forward for innovative and technological driven teaching and learning practices.

Online learning, which has been developing since the 1980s, became indispensable, leveraging platforms like Blackboard, Zoom, and WhatsApp for teaching and learning (Li 2022, 9; Dhawan 2020, 16). To participate effectively, both lecturers and students needed essential devices like smartphones and laptops, along with stable internet access. Swift adoption of diverse platforms by universities was crucial for the seamless delivery of lectures (Fauzi and Khusuma 2020, 67).

The COVID-19 pandemic significantly increased the use of digital technology in daily life (Nagel 2020, 861). Online classes have enhanced students' familiarity with digital learning technologies, with 78 per cent finding the online classroom environment comparable or superior to traditional methods (Wallis 2020; Li 2022, 14). Online learning provides flexibility, allowing students to personalize their learning experience by choosing access time, pace, and content (Dos Santos 2022, 2). This flexibility, combined with the availability of various materials stored online, enables learning at any time and from anywhere (Hung et al. 2010, 1082). Moreover, online classes have expanded educational access for students with disabilities and medical conditions, including those affected by COVID-19 (Migocka-Patrzałek et al. 2021, 263).

Despite advancements in online instruction and education, both lecturers and students faced challenges (Daniel 2020, 92). The success of online education relies on access to technology and the internet, creating challenges for those with unstable network connections (Adedoyin and Soykan 2020, 4). This is particularly true for many African students in South Africa, residing in impoverished areas with limited access to communication networks and facing affordability constraints for data plans (Hlatshwayo 2022, 15; United Nations 2020). Therefore, many students, mirroring the global situation, found themselves needing to hunt for open Wi-Fi areas, adding to the stress of remote learning (Holpuch 2020; Tam and Elazar 2020; Fishbane and Tomer 2020; Hlatshwayo 2022). Additionally, challenges such as the lack of electricity infrastructure, loadshedding, unaffordable high electricity prices, and the absence of electricity provision in some rural areas undermines the online learning programmes of universities (Hlatshwayo 2022, 4).

Digital competence encompasses the skills, knowledge, and attitudes necessary for utilizing ICT and digital devices (Ferrari 2012). While some students excel in using technological devices, software, and the internet, others may lag behind (Hung et al. 2010, 1086; Saifudin 2017, 107). In online courses, students with higher computer, internet, and online communication skills tend to perform better than those with modest digital skills (Li 2022, 3; Adedoyin and Soykan 2020, 4). Lack of Information Technology (IT) support exacerbates difficulties for these students (Hlatshwayo 2022). Moreover, familiarity with hardware and software associated with online learning might hinder not only students' comprehension but their satisfaction (Bączek et al. 2022, 4).

Online learning has proven effective in social sciences and humanities, but its compatibility with fields like sports sciences, engineering, and medical sciences, which require hands-on experiences, is debated (Leszczyński et al. 2018, 153). Laboratory-based courses present significant challenges as they rely on physical and social interaction among lecturers and students (Sahu 2020, 7542). This underscores the limitations of online learning in certain disciplines, necessitating efforts to bridge this compatibility gap (Leszczyński et al. 2018, 156).

A significant drawback of online learning is the lack of essential personal interactions, not only between students and teachers but also among fellow students (Saifudin 2017, 105). In traditional classrooms, teachers and students maintained close social connections, which were compromised by the physical distancing measures implemented during the pandemic (Jiang et al. 2022, 8). A study of 840 medical students' experiences with online education during the pandemic found that most students felt isolated due to limited interaction with teachers and peers (Bączek et al. 2021).

Adaptability presents another significant challenge. The shift from in-person to online learning demands time for students to acclimate to the new format (Dhawan 2020, 8). However, the sudden shift to virtual learning might not allow enough time for this adjustment (Lin and Nguyen 2021, 242). The absence of direct support from teachers, classmates, and the introduction of new teaching methods, combined with the stress, fear, isolation, depression, and anxiety related to COVID-19, could have hindered students from performing to the best of their abilities (Kaup et al. 2020, 1221). Consequently, the pandemic could have adversely impacted the mental and psychological well-being of students.

The abrupt transition to online learning, marked by inadequate training, bandwidth issues, and limited preparation, has posed significant challenges for students, as highlighted by experts (Adedoyin and Soykan 2020, 6; Leszczyński et al. 2018, 156). Conversely, some experts see this shift as establishing a "new normal," which has introduced valuable experiences such as ensuring educational continuity, enhancing learner-lecturer interactions through one-to-one

online communication, and bolstering students' confidence in a novel learning environment (Lin and Nguyen 2021, 246). Despite the profound changes caused by the COVID-19 in tertiary education globally, it has also provided unprecedented experiences offering valuable lessons. To adapt to post-pandemic circumstances, comprehensive reforms in educational concepts, teaching platforms, methods, and relationships are essential (Li 2022, 16).

Initially seen as a solution to pandemic-induced teaching challenges, online learning now requires formalization as part of a blended approach to education in South African universities, driven by academic leadership to ensure alignment with global trends. (Dhawan 2020, 6). This study aimed to assess the online experiences of students at a historically disadvantaged tertiary institution, potentially informing the advancement of contextually relevant learning theories like connectivism and the development of appropriately aligned digital pedagogies (Mpungose 2020, 113).

METHODS

Research design

To meet the study purpose, a descriptive, quantitative, survey design was utilized to investigate the perceptions of Speech-Language Pathology and Audiology (SLPA) students towards online learning during the COVID-19 pandemic.

Participants

This study employed non-probability, convenience sampling with a cohort of 84 SLPA students from a tertiary institution in Limpopo, South Africa. A total of 80 per cent of the students lived in Limpopo, and 20 per cent resided in surrounding areas in Gauteng; all the students belonged to the Black racial group. Undergraduate SLPA students from second year to fourth year were considered part of the target population due to their participation in online learning during the COVID-19 pandemic. Forty-three undergraduate SLPA students who were willing and available to participate completed the survey. Table 1 delineates the characteristics of the study participants.

Most participants were female (*n*=32; 74,4%), with 69,8 per cent of participants being between 19 and 24 years of age (*n*=30). The ages of participants ranged between 19–30 years old with a mean age of 23,8 years. Responses received included students from all three year groups with nearly equal distribution. Only 13 participants (30,2%) reported previous experience with online learning. Most of the participants (*n*=31; 72,1%) perceive their IT skills to be moderate.

Table 1: Participating Speech-Language Pathology and Audiology students' demographics.

Participants information	*n* = 43 (%)
Gender	
Female	32 (74,4)
Male	11 (25,6)
Age (Years)	
19–21	15 (34,9)
22–24	15 (34,9)
25–30	13 (30,2)
Year of study	
2nd year	13 (30,2)
3rd year	16 (37,2)
4th year	14 (32,6)
Previous experience with online learning	
Yes	13 (30,2)
No	30 (69,8)
Perceived IT* skills	
High IT skills	6 (14,0)
Moderate IT skills	31 (72,1)
Low IT skills	6 (14,0)

*IT: Information technology

Data collection

This study utilised a survey adapted from Bączek et al. (2021) which consisted of four sections, namely: (i) demographic information, (ii) advantages of online learning, (iii) disadvantages of online learning, and (iv) comparison between face-to-face and online learning. Primarily closed-ended questions were used supporting the quantitative nature of the study. Following ethical approval, the adapted survey was pilot tested to determine the quality and validity of results as well as the feasibility of the online survey distribution before conducting the study. Four undergraduate students from a Dietetics program completed a one-page feedback questionnaire for the pilot-test. Responses from the pilot-test confirmed the survey questions were accessible and comprehensible.

The survey was shared through an online link and distributed via email to all SLPA students from the second year to the fourth year. The survey was presented in English which is the language of instruction at the tertiary institution under study. To increase response rate, an email with the online survey link was shared twice weekly for 3 weeks.

Data analysis

Responses to the survey were collated automatically on a spreadsheet after participants selected the submit function at the end of the survey. Data analysis was completed using SPSS version 28.0 to formulate descriptive statistics which were presented including mean, percentages and statistical significance (Wilcoxon signed-rank test) (Leedy and Ormrod 2015). The categories were integrated and compared to identify emerging patterns and similarities across participants' perspectives.

Ethical considerations

Ethical clearance for this study was granted by the University Research and Ethics Committee (SMUREC/H/177/2022: UG). The survey questions, drawn from a previously published questionnaire with a similar objective adequately evaluated the construct under investigation, specifically, perceptions of online learning. Selection bias was avoided by giving equal opportunity–to all students within the selected population to participate. Analysis bias was avoided by using a statistical software package.

RESULTS

The survey was distributed to 84 SLPA students and 43 responses were received. The response rate was therefore 51,2 per cent, which is above the average response rate of 44 per cent (Wu, Zhao, and Fils-Aime 2022) and an excellent response rate (50%) according to Fryrear (2015). Most of the participants (*n*=31; 72,1%) perceived their IT skills to be moderate. The results are presented according to the objectives of the study.

Advantages and disadvantages of online learning

The SLPA students' perceived advantages and disadvantages of online learning during the COVID-19 pandemic are shown in Table 2.

Table 2: Students' perceived advantages and disadvantages of online learning

Advantages	*n* = 43 (%)	Disadvantages	*n* = 43 (%)
Ability to stay at home	20 (46,5)	Poor learning conditions at home	9 (20,9)
Comfortable surroundings	16 (37,2)	Technical challenges	32 (74,4)
Learning at your own pace	22 (51,2)	Lack of self-discipline	21 (32,6)
Ability to record meetings and lectures	30 (69,8)	Reduced interaction with the lecturer	25 (58,1)
Classes interactivity	5 (11,6)	Social isolation	14 (48,8)
Continued access to online material	29 (67,4)	Lack of interaction with patients	25 (58,1)

The participants perceived the most advantageous aspects of online learning to be the ability to record meetings and lectures (*n*=30; 69,8%), continued access to online materials (*n*=29;

67,4%), as well as the ability to study at their own pace (*n*=22; 51,2%). Being in a comfortable surrounding (*n*=16; 37,2%) and class interactivity (*n*=5; 11,6%) were the least indicated perceived advantages.

Technical challenges (*n*=32; 74,4%) were the most highlighted disadvantage of online learning. Lack of interaction was also a highlighted disadvantage of online learning, encompassing both insufficient engagement with the lecturer (58.1%) and a lack of interaction with patients (58.1%). Lack of self-discipline (*n*=21; 48,8%), social isolation (*n*=14; 32,6%) and poor learning conditions (*n*=9; 20.9%) were the least indicated disadvantages.

Effectiveness of online learning compared to traditional face-to-face teaching.

Students were asked to describe their perceived effectiveness of online learning as well as traditional face-to-face teaching in terms of knowledge acquisition, clinical skills development and social competence. The students' perceptions of effectiveness for each training function are depicted in Figures 1, 2 and 3.

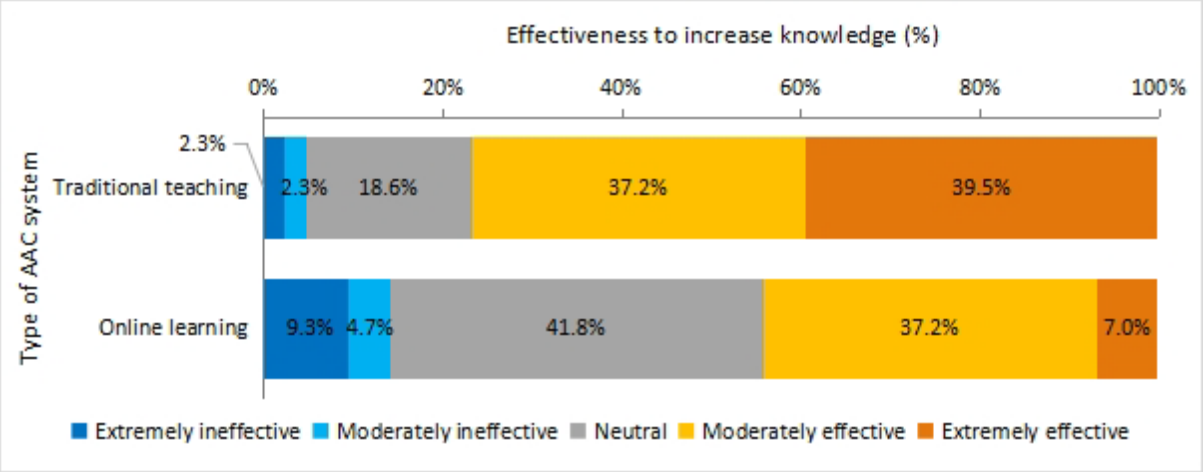

Figure 1: Perceived effectiveness of online learning in contrast to traditional teaching to increase knowledge.

Both online and traditional face-to-face teaching were perceived as moderately effective in increasing knowledge by the same number of students (n=16; 37,2%). However, 41,8 per cent of SLPA students (*n*=18) indicated neutrality regarding the effectiveness of online learning to increase knowledge, while only 7,0 per cent perceived online learning to be extremely effective. In contrast, 39,5 per cent of SLPA students (*n*=17) perceived traditional teaching to be extremely effective for increasing knowledge. No statistical difference (p=.383) was identified between online learning and traditional face-to-face teaching methods in terms of effectiveness to increase knowledge.

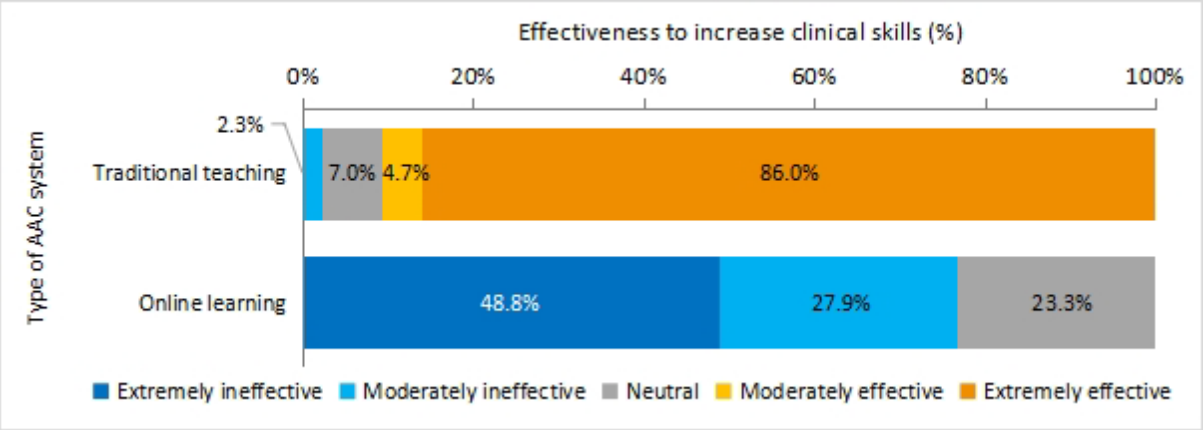

Figure 2: Perceived effectiveness of online learning in contrast to traditional teaching to increase clinical skills.

Findings show that a significant number of students regarded online learning as extremely ineffective in improving clinical skills (n=21; 48,8%), whereas traditional face-to-face teaching was regarded as extremely effective for improving clinical skills (86%). As such, a statistically significant difference (p=.023) between the effectiveness of traditional teaching (M=1,5) and online learning (M=8,6) to increase clinical skills is identified.

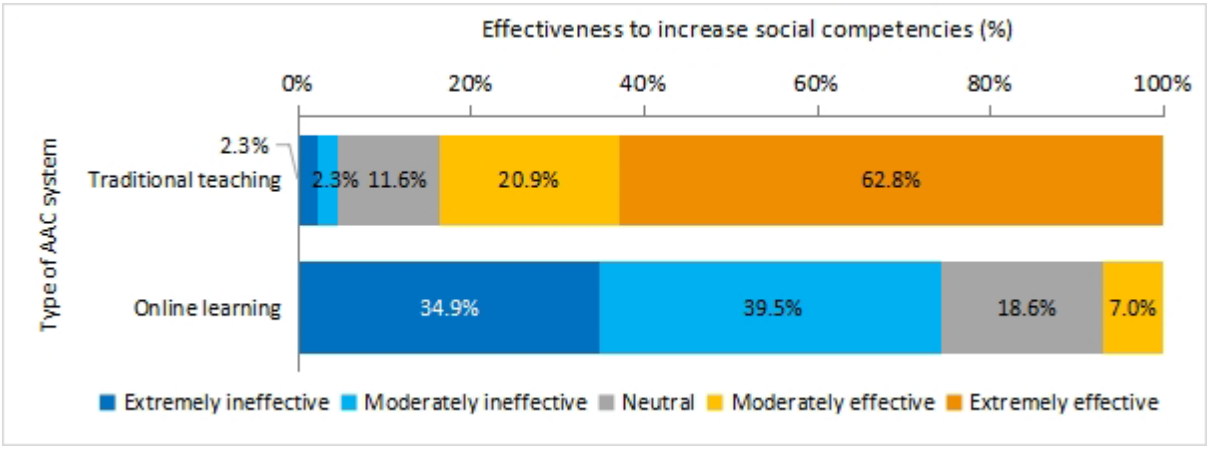

Figure 3: Perceived effectiveness of online learning in contrast to traditional teaching to increase social competencies.

Most SLPA students (*n*=32; 74,4%) regard online learning to be ineffective at increasing social competencies, with 17 students (39,5%) indicating moderately ineffective and 15 students (34,9%) indicating online learning to be extremely ineffective. Traditional face-to-face teaching was indicated as extremely effective in developing social competencies by 27 students (62,8%). A statistically significant difference (p=.022) between the effectiveness of traditional teaching and online learning to increase social competence was identified.

Figure 4 depicts SLPA students' perceived effectiveness of their activity during online learning in contrast with traditional face-to-face teaching.

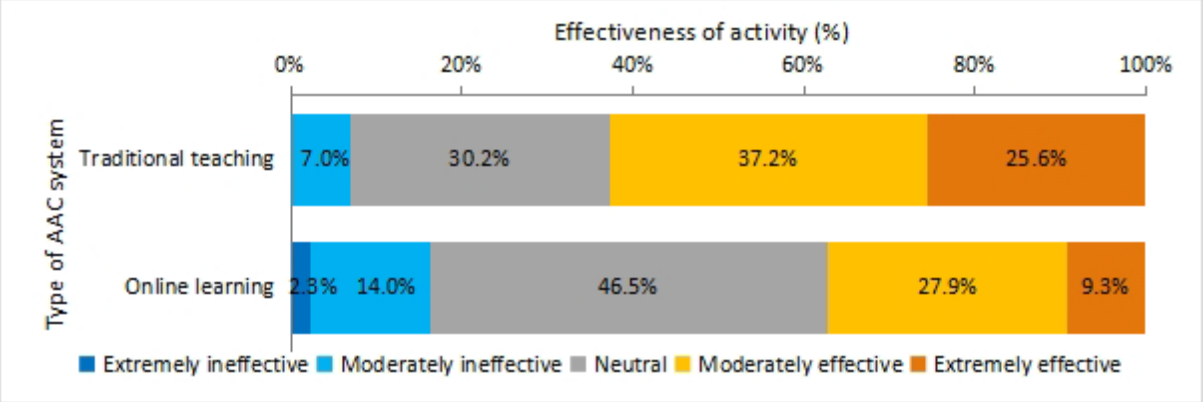

Figure 4: Perceived effectiveness of learning activities: online learning in contrast with traditional teaching

Twenty students (46,5%) were neutral regarding effectiveness of online activity. More students perceived online learning as ineffective (*n*=7; 16,3%) compared to traditional face-to-face teaching (*n*=3; 7%). Traditional teaching activities were perceived as effective by most SLPA students (*n*=27; 62,8%). Sixteen SLPA students (39,2%) perceived their activity during online learning to be effective, with four students (9,3%) indicating their activity was extremely effective for learning. No statistical difference (p=.828) between online learning (M=9.75) and traditional face-to-face teaching (M=8) was found.

Acceptance of online learning

SLPA students' experience of online learning as a contributor to professional development is depicted in Figure 5.

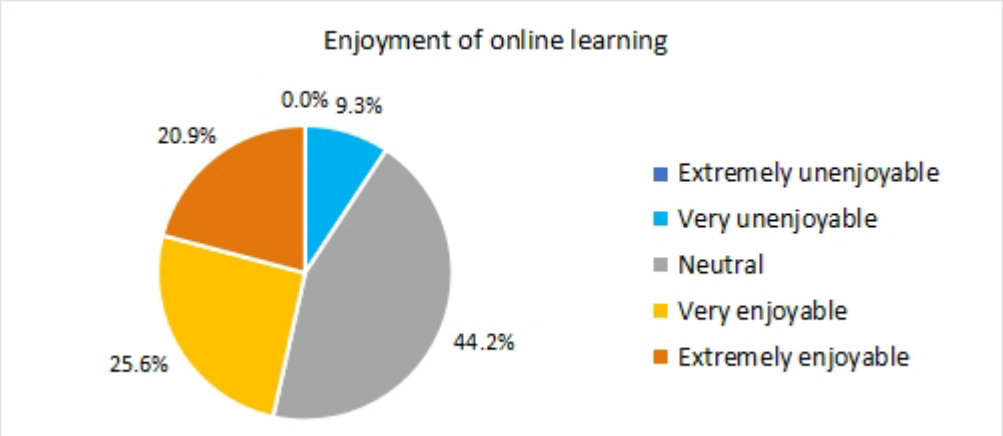

Figure 5: Pie chart depicting students' perceived enjoyment of online learning.

Four students (9,3%) did not enjoy online learning. Enjoyment of online learning was perceived by most students as neutral (*n*=19; 44,2%). Twenty students (46,5%) indicated online learning to be enjoyable, indicating acceptance of online learning as a contributor to professional skills development. Specifically, 11 students (25,6%) perceived online learning as very enjoyable and 9 students (20,9%) indicated extremely enjoyable.

DISCUSSION

The study determined the perceptions of Speech-Language Pathology and Audiology students towards online learning during the COVID -19 pandemic. Student perceptions on learning experiences during the pandemic might shed light on the advancement of online teaching and learning pedagogies. With the expeditious transition from face-to-face to online learning as a result of the COVID-19 pandemic, both academics and students were met with unfamiliar and new teaching and learning strategies. Therefore, the perceptions emerging from the COVID-19 pandemic has precipitated discussions about the future of the higher education teaching and learning agenda in South Africa. Student perceptions in this context therefore becomes central in re-imagining the teaching and learning landscape.

The findings of the study indicated that majority of the participants had limited exposure to online learning. Published studies concur with this assertion (Van de Heyde and Siebrits 2019, 1; Aboagye, Yawson, and Appiah 2020, 2). Not only has this factor raised concerns about institutional under-preparedness in effectively transitioning students to an online learning environment, but it also highlights historical inequalities where students from disadvantaged backgrounds still face unequal educational opportunities (Moonasamy and Naidoo 2022,77).

The expectation of students to effortlessly transition into an online learning environment against the backdrop of limited to no exposure to digital learning technologies is an unrealistic one. Rafique et al. (2021) posits that for students to effectively thrive within a digital learning environment, a certain degree of preparedness and exposure is required. Prensky (2009) identifies two types of students who may enter a digital learning environment: digital natives, who have grown up with digital technology and are comfortable with it from a young age, and digital immigrants, who have adapted to digital technology later in life. Given this distinction, it is crucial for institutions to be prepared for providing online learning support and training, particularly when admitting students from low socio-economic backgrounds.

Participants viewed continued access to learning materials, including lecture recordings, to be an advantage within the online learning environment. These findings concur with that of several other authors (Van Wart et al. 2020, 18, Ozfidan, Fayez, and Ismail 2021, 465). Oranburg (2020) emphasizes that providing online learning materials and resources is

considered best practice and is a key component of the online learning ecosystem. Proficiency in navigating online materials and digital educational tools is an essential skill. Not only does exposure to online resources during education allow students to excel academically but further prepares students for entry into a modern, digitally enhancing workforce.

Findings of the study indicated technical difficulties as the most prevailing challenge. Whilst online learning environments have the potential to revolutionize the higher education landscape, several technical challenges constrain its optimal utilization and these include internet connectivity, platform reliability, security concerns and digital literacy (Fawaz, Al Nakhal, and Itani 2021, 7632; Adarkwah 2021, 1676). South Africa faces a significant digital divide, primarily due to socioeconomic disparities, uneven infrastructure development, and limited access to technology (Moonasamy and Naidoo 2022, 77). Addressing the digital divide requires concerted effort from academic leadership, government, private sector, and civil society to ensure equitable access to technology, affordable internet, and digital literacy programs, particularly targeting underserved communities.

Lack of interaction with peers and lecturers was a further challenge noted by the participants. According to Azmat and Ahmad (2022), learning effectiveness is enhanced through online interaction and further details that this online interaction can take on three forms namely instructor–learner, learner–learner, and content–learner interaction. To facilitate maximal interaction and minimize isolation in online learning environments, academics should integrate discussion forums, live video sessions, and other collaborative tools to encourage active participation and create a more supportive online learning environment.

The advantages to online learning were identified in the study as learning at own pace, ability to stay home and access to materials (lectures, reading materials and recorded lectures). Learning at one's own pace makes education more accessible and adaptable to individual learning styles, while also increasing student autonomy and flexibility within the learning environment. Academics must encourage self-paced learning while simultaneously ensuring the development of self-discipline and dedication, as self-paced learning and self-discipline are mutually inclusive. The ability to learn from home was a positive experience for the participants in this study, which contrasts with the majority of literature from developing contexts, where learning from home is often viewed as a barrier due to issues such as noise, competing family responsibilities, and a lack of conducive spaces for online learning sessions (Barrot, Llenares and Del Rosario 2021, 7333; Day et al. 2021, 6). This finding implies that contextual factors may vary among students due to their unique socio-economic circumstances, and these factors should be considered in the design of online learning programs. Access to online learning materials were also noted as advantageous in other studies (Mukhtar et al. 2020, S30; Jawaid

and Ashraf 2012).

Whilst online and traditional face to face learning was found to be equally effective in terms of increasing theoretical knowledge, online learning was regarded as ineffective in improving clinical skills and in developing social competence. This result was consistent with the findings of other studies (Saad et al. 2023, 11; Mukhtar et al. 2020, S30). Developing clinical skills in an online learning environment can present several challenges due to the hands-on and interactive nature of clinical practice. Obstacles to online clinical skills development include limited physical interaction and hands-on experience, such as directly touching a patient. Moreover, online communication may lead to misinterpretation or lack of clarity, which can hinder the understanding of complex clinical procedures or techniques (Saad et al. 2023, 11; Mukhtar et al. 2020, S30). Various techniques are accessible to enhance online clinical training including interactive online platforms, virtual laboratories to enhance the immersive experience and live demonstrations. Therefore, the need for innovative online clinical training methodologies requires a rapid response from academic leadership. The digital divide and challenges in developing social competence and clinical skills remain primary obstacles to a smooth transition into the online learning environment. Academic leadership is required to charter the course toward effective online learning environments and requires a combination of technology, pedagogy, and ongoing support for all stakeholders.

Participants viewed the online environment as ineffective in the development of their social competence. Online learning without sufficient design thinking could constrain the development of social competence. Developing social competence in an online learning environment involves fostering interpersonal skills, effective communication, collaboration, and a sense of community among students. A social competency profile could feature in online pedagogies. Digital citizenship must be cultivated to ensure appropriate online behaviour, correct digital etiquette, respect, and responsible use of technology (Lu et al. 2023, 252). Digital citizenship can create an inclusive and collaborative online learning environment that enhances social competence among students.

LIMITATIONS

This study has certain limitations that should be acknowledged. Firstly, the response rate was limited, with only 43 students participating in the survey, leading to a small sample size. Consequently, the findings cannot be extrapolated to the larger population. Additionally, the study focused solely on one university. Including other universities in Gauteng could have provided a more comprehensive understanding of students' perceptions of online and face-to-face learning. Furthermore, the questionnaire used in this study was adapted from a previous

research study. While it served as a useful tool, further validation, improvement, and adaptation to the South African context may be necessary for enhanced reliability and relevance.

CONCLUSION AND RECOMMENDATIONS

The nuanced perceptions of students regarding an online learning environment provide a better understanding of this environment, which is important for future professors and policymakers to address. There must be a concerted effort toward creating more inclusive and effective online learning environments. The digital divide, and challenges with the development of social competence and clinical skills remain primary hinderances toward the effortless transition into the online learning environment. Academic leadership is required to charter the course toward effective online learning environments and requires a combination of technology, pedagogy, and ongoing support for all stakeholders. This should inspire the future and current professoriate toward re-imagining the future of online learning.

REFERENCES

Aboagye, E., J. A. Yawson, and K. N. Appiah. 2020. "COVID-19 and E-Learning: The Challenges of Students in Tertiary Institutions." *Social Education Research* 2(1): 1–8. https://doi.org/10.37256/ser.212021422. (Accessed 3 December 2023).

Adarkwah, M. A. 2021. "'I'm not against online teaching, but what about us?': ICT in Ghana post Covid-19." *Education and Information Technologies* 26(2): 1665–1685.

Adedoyin, O. B. and E. Soykan. 2020. "Covid-19 pandemic and online learning: The challenges and opportunities." *Interactive Learning Environments* 31(2): 1–11. https://doi.org/10.1080/10494820.2020.1813180. (Accessed 1 December 2023).

Azmat, M. and A. Ahmad. 2022. "Lack of Social Interaction in Online Classes During COVID-19." *Journal of Materials and Environmental Science* 13(2): 185–196.

Bączek, M., M. Zagańczyk-Bączek, M. Szpringer, A. Jaroszyński, and B. Wożakowska-Kapłon. 2021. "Students' perception of online learning during the COVID-19 pandemic: A survey study of Polish medical students." *Medicine* 100(7): 1–6.

Barrot, J. S., I. I. Llenares, and L. S. del Rosario. 2021. "Students' online learning challenges during the pandemic and how they cope with them: The case of the Philippines." *Education and Information Technologies* 26(6): 7321–7338.

Choi, J. J., C. A. Robb, M. Mifli, and Z. Zainuddin. 2021. "University students' perception to online class delivery methods during the COVID-19 pandemic: A focus on hospitality education in Korea and Malaysia." *Journal of Hospitality, Leisure, Sport and Tourism Education* 29(2): 17–27.

Daniel, J. 2020. "Education and the COVID-19 pandemic." *Prospectus* 49(1): 91–96.

Day, T., I. C. C. Chang, C. K. L. Chung, W. E. Doolittle, J. Housel, and P. N. McDaniel. 2021. "The immediate impact of COVID-19 on postsecondary teaching and learning." *The Professional Geographer* 73(1): 1–13.

Dhawan, S. 2020. "Online Learning: A Panacea in the Time of COVID-19 Crisis." *Journal of Educational Technology* 49(1): 5–22.

Dos Santos, L. M. 2022. "Online learning after the COVID-19 pandemic: Learners' motivations." *Frontiers in Education* 7: 879091. https://doi.org/10.3389/feduc.2022.879091.

Fauzi, I. and I. H. S. Khusuma. 2020. "Teachers' Elementary School in Online Learning of COVID-19

Pandemic Conditions." *Journal Iqra': Kajian Ilmu Pendidikan* 5(1): 58–70. https://doi.org/10.25217/ji.v5i1.914.

Fawaz, M., M. Al Nakhal, and M. Itani. 2021. "COVID-19 quarantine stressors and management among Lebanese students: A qualitative study." *Current Psychology* 41: 7628–7635.

Ferrari, A. 2012. "Digital Competence in practice: An analysis of frameworks." EUR 25351 EN, Luxembourg (Luxembourg), Publications Office of the European Union. https://publications.jrc.ec.europa.eu/repository/handle/JRC68116. (Accessed 1 December 2023).

Fishbane, L. and A. Tomer. 2020. "As classes move online during COVID-19, what are disconnected students to do?" Brookings. https://www.brookings.edu/blog/the-avenue/2020/03/20/as-classes-move-online-during-covid-19-whatare-disconnected-students-to-do/. (Accessed 1 December 2023).

Fryrear, A. 2015. "What's a Good Survey Response Rate?" https://www.surveygizmo.com/resources/blog/survey-responserates/. (Accessed 15 June 2022).

Hlatshwayo, M. 2022. "Online Learning during the South African Covid-19 Lockdown: University Students Left to Their Own Devices." *Education as Change* 26(1). https://www.scielo.org.za/scielo.php?script=sci_arttext&pid=S1947-94172022000100033. (Accessed 1 December 2023).

Holpuch, A. 2020. "US's Digital Divide 'Is Going to Kill People' as Covid-19 Exposes Inequalities." *The Guardian* April 13, 2020. https://www.theguardian.com/world/2020/apr/13/coronavirus-covid-19-exposes-cracks-us-digital-divide. (Accessed 1 December 2023).

Hung, M. L., C. Chou, C. H. Chen, and Z. Y. Own. 2010. "Learner readiness for online learning: Scale development and student perceptions." *Computers and Education* 55(3): 1080–1090.

Jawaid, M. and J. Ashraf. 2012. "Initial experience of eLearning research module in undergraduate medical curriculum of Dow University of Health Sciences: Development and student perceptions." *Pakistan Journal of Medical Sciesces* 28(4): 591–596.

Jiang X., T.-T. Goh, and M. Liu. 2022. "On Students' Willingness to Use Online Learning: A Privacy Calculus Theory Approach." *Frontiers in Psychology* 13: 880261. https://doi.org/10.3389/fpsyg.2022.880261.

Kaup, S., R. Jain, S. Shivalli, S. Pandey, and S. Kaup. 2020. "Sustaining academics during covid-19 pandemic: The role of online teaching-learning." *Indian Journal of Ophthalmology* 68(6): 1220–1221.

Leedy, Paul D. and Jeanne Ellis Ormrod. 2015. *Practical Research: Planning and Design, Global Edition.* 11th Edition. Boston: Pearson.

Leszczyński, P., A. Charuta, B. Łaziuk, R. Gałązkowski, A. Wejnarski, M. Roszak, and B. Kołodziejczak. 2018. "Multimedia and interactivity in distance learning of resuscitation guidelines: A randomised controlled trial." *Interactive Learning Environments* 26(2): 151–162. https://doi.org/10.1080/10494820.2017.1337035.

Li, D. 2022. "The Shift to Online Classes during the Covid-19 pandemic: Benefits, Challenges, and Required Improvements from the Students' Perspective." *Electronic Journal of e-Learning* 20(1): 1–18. www.ejel.org.

Lin, Y. and H. Nguyen. 2021. "International students' perspectives on e-learning during covid-19 in higher education in Australia: A study of an Asian student. *Electronic Journal of e-Learning* 19(4): 241–251.

Lu, H., Kefeng Fu, Xiaolin Liu, and Wanshan Hu. 2023. "Digital citizen participation of college students: Reality and optimization path. *Problems of Education in the 21st century* 81(2): 244–257.

Migocka-Patrzałek, M., M. Dubińska-Magiera, D. Krysiński, and S. Nowicki. 2021. "The attitude of the academic community towards distance learning: A lesson from a national lockdown." *Electronic Journal of e-Learning* 19(4): 262–281.

Mohalik, R. and S. Sahoo. 2020. "E-readiness and perception of student teachers' towards online learning in the midst of COVID-19 pandemic." https://ssrn.com/abstract=3666914 or

http://dx.doi.org/10.2139/ssrn.3666914. (Accessed 30 November 2023).

Moonasamy, A. R. and G. M. Naidoo. 2022. "Digital Learning: Challenges experienced by South African university students' during the COVID-19 pandemic." *The Independent Journal of Teaching and Learning* 17(2): 76–90.

Mpungose, C. B. 2020. "Emergent transition from face-to-face to online learning in a South African University in the context of the Coronavirus pandemic." *Humanities & Social Sciences Commununications* **7**, Article number 113.

Mukhtar, K., K. Javed, M. Arooj, and A. Sethi. 2020. "Advantages, Limitations and Recommendations for online learning during COVID-19 pandemic era." *Pakistan Journal of Medical Sciences* 36(COVIC 19-S4): S27–S31.

Nagel, L. 2020. "The influence of the COVID-19 pandemic on the digital transformation of work." *International Journal of Sociology and Social Policy* 40(9/10): 861–875.

Oranburg, S. C. 2020. "Distance Education in the Time of Coronavirus: Quick and Easy Strategies for Professors." Duquesne University School of Law Research. https://bond.edu.au/files/4830/Distance%20Education%20in%20 the%20time%20of%20the%20Coronavirus.pdf. (Accessed 3 December 2023).

Ozfidan, B., O. Fayez, and H. Ismail. 2021. "Student perspectives of online teaching and learning during the COVID-19 pandemic." *Online Learning* 25(4): 461–485.

Prensky, M. 2009. "H. sapiens digital: From digital immigrants and digital natives to digital wisdom." *Journal of Online Education* 5(3): 1–9.

Rafique, G. M., K. Mahmood, N. F. Warraich, S. Ur Rehman. 2021. "Readiness for Online Learning during COVID-19 pandemic: A survey of Pakistani LIS students." *Journal of Academic Librarianship* 47(3): 102346.

Saad, S., C. Richmond, D. King, C. Jones, and B. Malau-Aduli. 2023. "The impact of pandemic disruptions on clinical skills learning for pre-clinical medical students: Implications for future educational designs." *BMC Medical Education* 23(1): 364.

Sahu, P. 2020. "Closure of universities due to coronavirus disease 2019 (covid-19): Impact on education and mental health of students and academic staff." *Cureus* 12(4): 7541–7541.

Saifuddin, M. F. 2017. "E-Learning dala, Persepsi Mahasiswa." *Varia Pendidikan* 29(2): 102–109.

Singhal, T. 2020. "A review of coronavirus disease-2019 (COVID-19)." *The Indian Journal of Pediatrics* 87(4): 281–286.

Tam, G. and D. Elazar. 2020. "3 ways the coronavirus pandemic could reshape education." World Economic Forum. https://www.weforum.org/agenda/2020/03/3-ways-coronavirus-is-reshaping-education-and-what-changes-might-be-here-to-stay. (Accessed 1 December 2023).

UNESCO. 2020. "Education: From disruption to recovery." United Nations Educational, Scientific and Cultural Organization. https://en.unesco.org/covid19/educationresponse. (Accessed 30 November 2023).

Van de Heyde, V. and A. Siebrits. 2019. "The ecosystem of e-learning model for higher education." *South African Journal of Science* 115(5–6): 1–6.

Van Wart, M., A. Ni, P. Medina, J. Canelon, M. Kordrostami, J. Zhang, and Y. Liu. 2020. "Integrating students' perspectives about online learning: A hierarchy of factors." *International Journal of Educational Technology in Higher Education* 17, Article number 53.

Wallis, L. 2020. "Growth in Distance Learning Outpaces Total Enrollment Growth." file:///C:/Users/thilendree.kyarkanay/Downloads/osl_21829_OBJ.pdf. (Accessed 1 December 2023).

Wu, Meng-Jia, Kelly Zhao, and Francisca Fils-Aime. 2022. "Response Rates of Online Surveys in Published Research: A Meta-Analysis." *Computers in Human Behavior Reports* 7: 100206. https://doi.org/10.1016/j.chbr.2022.100206.