Information Technology Factors Impacting Educators before and During COVID-19: A Study of Developing Countries

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ARTICLE DETAILS

Abstract

Purpose: The purpose of the paper is to explore the negative impact of information technology (IT) factors prior to and during COVID-19 from the perspectives of developing country educators, to obtain context to the higher education environment to aid future teaching practices.

Design/methodology/approach: The study employs a mixed method approach comprising a questionnaire and interviews with educators situated in two African developing countries from the South African Development Community (SADC).

Findings: This paper found that the IT factors that most adversely impacted educators’ delivery of the academic programme, was the student element (students’ internet access, students’ access to IT equipment, students’ proficiency with technology and data costs for students). The IT factors negative impact was mostly also intensified amid the pandemic.

Implications/Originality/Value: Far from being just a disruption, the pandemic is an indication of the urgent need to build sustainable higher education institutions to ensure that educators deliver quality academic programmes to all. The research obtained an understanding of IT factors (past and present) that may hinder educators’ orientations towards the future. Bringing to the fore the IT hindrances, educators can act by means of their environment, to enable teaching to continue under all conditions.

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Introduction

During the past two years, the COVID-19 pandemic disrupted global education, particularly higher education (Tharapos, 2021). According to a statement made by Audrey Azoulav, Director General of the United Nations Educational, Scientific and Cultural Organisation (UNESCO), “Never before have we witnessed educational disruption on such a large scale” (UNESCO, 2020). The consequences of the COVID-19 outbreak, which included lockdown restrictions, social distancing and other public health interventions to curb the spread, resulted in a sudden and unplanned
transition to online learning for many contact-based institutions across the globe (Hodges, Moore, Lockee, Trust & Bond, 2020). Previously, only a small portion of students globally was taught online (Sangster, Stoner & Flood, 2020). Approximately 220 million students were disrupted by the pandemic, resulting in a rapid transition to online learning (UNESCO, 2021).

Pope Francis when describing the human experience of the pandemic stated that “we are on the same boat” (Religion News Service, 2020). Contrary to this Doria and Mendinueta (2021) convey that “we are going through the same storm rather than in the same boat” (p. 112). Consequently, the sudden pivot to online learning disproportionally impacted the vulnerable and disadvantaged higher education institutions (HEIs) and deepened inequities (Azevedo et al., 2021). Goal 4 of the sustainable development goals (SDGs) on education conveys that it must: ‘Ensure inclusive and equitable quality education’ for all (United Nations, 2015). Yet the “uneven impact” of the pandemic was felt between HEIs, especially between those in developed and developing countries (Sangster et al., 2020, p. 436). The latter is considered to have the “weakest safety nets” (Azevedo et al., 2021, p. 6), with the lack of state funding often being the largest contributing factor (UNESCO, 2021). Moreover, the sudden pivot online was particularly difficult for educators in developing countries due to the digital divide (Mpungose, 2020) as information communication technologies (ICTs) became the crux around which formal education evolved (Hussein, 2021).

The pandemic is now a thing of the past. However academic programmes have been altered, and hybrid learning is here to remain for the previous contact-based offerings (Prabawangi, Fatanti & Ananda, 2021). Furthermore, in view of this global pandemic, or other social disruptions that may arise, it is important to explore the impact of IT factors on educators, to ensure that quality programmes are delivered to all (UNESCO 2020; United Nations 2015).

A plethora of studies have resulted since the pandemic, often with a focus on educators (Beatson et al., 2021; Burt et al., 2021; Drinkwater, 2021; Sangster et al., 2020) and students (Adnan & Anwar, 2020; Agormedah et al., 2020; Burt et al., 2021; Drinkwater, 2021; Kaisara & Bwalya, 2020; Mpungose, 2020; Prabawangi et al., 2021; Reid et al., 2021; Sturm & Pinsent-Johnson, 2021) at HEIs. This study adds a different dimension by underscoring the agency theory. Emirbayer and Mische (1998) suggest that agency should be understood as a temporally embedded process of social engagement, informed by the past (in its habitual aspect), but also oriented toward the future (as a capacity to imagine alternative possibilities) and toward the present (as a capacity to contextualize past habits and future projects within the contingencies of the moment) (p. 963).

In using the agency theory, this study aims to understand IT factors (past and present) that may hinder educators’ orientations towards the future (Emirbayer & Mische, 1998). The agency theory emphasizes that individuals must act by means of their environment (i.e., available resources, contextual conditions, structural factors) to bring about change (Priestley, Biesta & Robinson, 2015).

This study will address the IT factors that negatively impacted educators’ delivery prior and during the pandemic to provide context to the higher education environment. This context should be assessed to assist educators in achieving agency for their future teaching practices (Biesta, 2015; Priestley et al., 2015), to ensure “inclusive and equitable education” for all (United Nations, 2015). This paper frames its exploration of the agency theory through its intersections with the digital divide experienced by HEIs within developing countries.

The following section details the use of online learning, followed by describing the impact of the COVID-19 pandemic on developing markets by outlining the challenges of the digital divide. The research methodology is then explained in Section three, followed by a discussion of the findings of the IT factors that negatively impacted educators prior and during the pandemic. Section five
concludes the paper where the contribution, limitations of the study and suggestions for future research are detailed.

**Literature Review**

Historically, HEIs afforded attention to online learning given the opportunities to communicate and deliver academic programmes from innovative ICT platforms (Mittelmeier et al., 2021). With online learning, the barriers of distance, time and borders are no longer relevant (Adnan & Anwar, 2020; Prabawangi et al., 2021) as it can be provided to students in remote rural areas or densely populated urban areas (Mittelmeier et al., 2021). Moreover, given its flexible provisions, it is an avenue for part-time students to balance family and work commitments (Mensah & Owusu-Mensah, 2002) and thus can reach a larger cohort of the student population (Mittelmeier et al., 2021). Online learning can take place in real-time using ICT platforms such as Skype, Zoom or Microsoft Teams (synchronous learning), or it can occur with a time-delay by using for example forums, pre-recorded videos or podcasts (asynchronous learning) (Drinkwater, 2021). Online learning, is thus referred to by some as an equalizer, given its flexible provisions (Mensah & Owusu-Mensah, 2002; Task Force, 2000).

With the onset of the pandemic, many HEIs globally had to cancel their contact-based offerings, and educators were forced to deliver academic programmes online (Ali, 2020). This form of emergency remote teaching is different from carefully planned and designed online courses. It rather served as a transitory shift to fully online delivery and assessment, due to the pandemic, where educators would otherwise present their academic programmes using contact or blended learning offerings. There was no easing-in period or careful design and planning during the pandemic, which is generally accompanied with major educational changes (Hodges et al., 2020).

The disruption to online learning “pushed the possibilities for how technology might be used to support and enhance learning” (Kelly, Hall & Connolly, 2022, p. 2). This often resulted in increased learning and collaboration among educators to ensure continuity of the academic programme (Tharapos, 2021). Furthermore, COVID-19 highlighted the benefits of ICTs to teaching and learning (Kaisara & Bwalya, 2022). Scholars for example, argue that online learning can improve the quality of education (Adnan & Anwar, 2020) as students report increased confidence when engaging in online classroom discussions (Prabawangi et al., 2021). Students are also able to access pre-recorded content and find this helpful for their learning (Al-Mawee, Kwayu & Gharaibeh, 2021). Moreover, online learning can result in a reduced cost for students (Prabawangi et al., 2021).

Despite the benefits for online teaching and learning, the pivot online revealed emerging vulnerabilities in higher education systems globally which cannot be ignored or dismissed (Ali, 2020). Online learning within the African continent, is thus referred to being in “an embryonic stage” (Kaisara & Bwalya, 2022, p. 309) as 24% of HEIs cancelled teaching because of the disruption caused by the pandemic, and only 29% of African HEIs were able to transition to online learning, compared to 85% of HEIs in Europe (Marinoni, Land & Jensen, 2020). Certain scholars view, that this result was anticipated given the digital divide experienced on the Africa continent (Mpungose, 2020). The African continent for example, has the lowest internet penetration rate globally (46.8%) among the seven regions of the world (Internet World Stats, 2022).1

Similarly, Holmner (2008) remarks on the absence of the pillars of information and knowledge societies in developing countries, resulting in a challenge for educators and students keeping abreast of the constant advances in ICTS (Mpungose, 2020). While others highlight that ICT infrastructure and educator development are key challenges facing HEIs in Africa (Hussein, 2021).

1 The second lowest region is Asia with a 67.4% internet penetration rate and North America the highest with a 93.4% internet penetration rate (Internet World Stats, 2022).
Educators from developing markets were therefore, challenged on all fronts during the pandemic and several factors impaired students’ learning, including, *inter alia*, inadequate connectivity (in terms of internet access, data costs and the instability of power supply) (Prabawangi et al., 2021; Sturm & Pinsent-Johnson, 2021), the absence of devices (printers, WIFI routers, computers, laptops or tablets)² (Agormedah et al., 2020; Mpungose, 2020), the lack of inadequate learning resources, and shortage of ICT training (Hussein, 2021; Sangster et al., 2020). Students were also impeded by their capacity to use HEIs’ Learning Management Systems (LMSs) (Mpungose, 2020) and other ICT learning platforms (Mhlanga & Moloi, 2020; Sturm & Pinsent-Johnson, 2021).

The divide between the “haves” and the “have nots” is widening with online learning in emerging markets (Sturm & Pinsent-Johnson, 2021). In the words of Sturm and Pinsent-Johnson (2021):

> Those who are excluded or have limited access do not have the digital means to take part in increasingly online-only interactions. They are unable to fully engage with technology and benefit from its use (p. 75).

The digital divide needs to recognized otherwise the “existing social inequalities will prevail” (Sturm & Pinsent-Johnson, 2021, p. 78). Investment is urgently required to upgrade technology at both a university and community level (Mpungose, 2020). Basic technological infrastructure needs to be available to ensure equitable access to educators and students (Crandall, 2021). This is echoed by Marinoni et al. (2020) who point to infrastructure and online access as two essential prerequisites to transit to online teaching and learning. Furthermore, this requires an

> [...] onoging effort. Not just because technology is rapidly changing but more so because the access challenges are complex and have been persisting and increasing, so that continued efforts are essential to mitigate the digital divide effects (Sturm & Pinsent-Johnson 2021, p. 78).

Lastly, the move to online offerings was unexpected and confounding (Hodges et al., 2020), resulting in HEIs not having contingency plans or policies to guide the use of online teaching and learning amid the pandemic (Sangster et al., 2020). Furthermore, even before the pandemic “the world was in the midst of a global learning crisis that threatened countries’ efforts” to build the human capital of students (Azevedo et al., 2021, p. 1). It is therefore, both necessary and timely to examine the impact of these IT factors on educators to ensure that no student is left behind (United Nations, 2015). Together, the above studies underscore the imperative of ascertaining the negative impact of IT factors on the delivery of the academic programme, before and during the COVID-19 pandemic in developing counties.

**Research Method**

This research was conducted using two stages of data collection. The first data source was collected through a questionnaire, while the second stage used interviews to augment findings and obtain deeper information from participants. The participants in the study are educators employed at HEIs in developing countries in South Africa and Namibia. In both South Africa and Namibia, the governments declared a nation-wide lockdown to curb the spread of COVID-19 (Amesho, Ahmadi & Lucero-Prisno, 2020), resulting in a sudden transition to online learning (Kaisara & Bwalya, 2021). These two developing countries were selected given that they are both situated in the Southern African Development Community (SADC) and experience similar internet penetration rates. South Africa and Namibia for example, have an internet penetration rate of 57,5% and 52,1%.

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² Students, for example, mainly accessed academic content via their mobile phones (Kaisara & Bwalya, 2020).
respectively (Internet World Stats, 2022). Furthermore, both HEIs are public universities. The educators from both HEIs teach on professional undergraduate academic programmes and did not have previous experience with online offerings prior to the pandemic.

A self-developed questionnaire was administered to educators in Stage 1. Section 1 of the questionnaire asked respondents to provide their demographic information. Sections 2 and 3 required respondents to rate on a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) about the negative impact of IT factors on the delivery of a quality academic programme. The IT factors included in the questionnaire were obtained following an extensive canvassing of the literature. Section 2 focused on the IT factors prior to the pandemic, while Section 3 asked respondents to rate these IT factors and their impact amidst the pandemic. Both Sections 2 and 3 contained open-ended questions for respondents to comment on the provided IT factors or provide any additional IT factors that hindered them in the delivering a quality academic programme.

Stage 1 comprised distributing questionnaires to 27 participants, 13 from institution A (Namibia) and 14 from institution B (South African). In total, 23 respondents completed the questionnaire; 11 from institution A and 12 from institution B, giving a response rate of 85%. However, in line with the stipulations in the ethical approval, the completion of the questionnaire was voluntary, and respondents could refrain from completing the questionnaire or answering certain questions. The demographic composition of respondents is outlined in Table 1.

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3 Some of the lowest internet penetration rates are experienced by other SADC countries such as Malawi (13.8%), Democratic Republic of Congo (17.4%) and Mozambique (20.3%) (Internet World Stats, 2022).
Table 1  

<table>
<thead>
<tr>
<th>Demographic composition of respondents</th>
<th>Institution A</th>
<th>Institution B</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n = 11</td>
<td>%</td>
<td>n = 12</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Male</td>
<td>6</td>
<td>55%</td>
<td>10</td>
</tr>
<tr>
<td>- Female</td>
<td>5</td>
<td>45%</td>
<td>2</td>
</tr>
<tr>
<td>First language</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- English</td>
<td>2</td>
<td>18%</td>
<td>1</td>
</tr>
<tr>
<td>- Other</td>
<td>9</td>
<td>82%</td>
<td>11</td>
</tr>
<tr>
<td>Highest qualification</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Bachelor’s degree</td>
<td>-</td>
<td>0%</td>
<td>-</td>
</tr>
<tr>
<td>- Postgraduate diploma</td>
<td>3</td>
<td>27%</td>
<td>9</td>
</tr>
<tr>
<td>- Master’s degree</td>
<td>7</td>
<td>64%</td>
<td>2</td>
</tr>
<tr>
<td>- Doctoral degree</td>
<td>1</td>
<td>9%</td>
<td>1</td>
</tr>
<tr>
<td>Position at institution</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Assistant lecturer</td>
<td>1</td>
<td>9%</td>
<td>-</td>
</tr>
<tr>
<td>- Lecturer</td>
<td>8</td>
<td>73%</td>
<td>2</td>
</tr>
<tr>
<td>- Senior lecturer</td>
<td>2</td>
<td>18%</td>
<td>9</td>
</tr>
<tr>
<td>- Associate professor</td>
<td>-</td>
<td>0%</td>
<td>1</td>
</tr>
<tr>
<td>- Professor</td>
<td>-</td>
<td>0%</td>
<td>-</td>
</tr>
</tbody>
</table>

Source: Authors compilation  
Note: Percentages do not always equal 100%, due to decimal rounding.

As regards to respondents’ other demographic composition, respondents accounted for 70% male and 30% female. Three respondents indicated their first language as English, while 87% of respondents first language was not English. Respondents’ highest qualification ranged from a postgraduate diploma (52%) to doctoral degrees (9%). Evidently, academic positions ranged from assistant lecturer to associate professor, with most respondents holding the position of senior lecturer (48%).

The second technique used to gather data was semi-structured interviews. Semi-structured interviews provide an appropriate method for collecting the participants’ views, by offering structure, while providing room to probe further and augment findings (Ellington & Williams, 2017). Interviews were not conducted with all participants in Stage 1. The demographic data from Stage 1 of the study was used to identify participants for the interview stage. Using this technique, the researcher purposively selected a mix of educators to ensure an equal split of interviewees from both HEIs. Secondly, interviewees were also selected ensuring a wide range of characteristics (gender, highest qualification and position at the HEI) to obtain a variety of perspectives. An array of characteristics was evident in Stage 1 of the data collection process, and this provided a good foundation for Stage 2 to allow for the possibility of a wider range of application for the researcher (Merriam, 2009).

The study, therefore, followed a mixed method approach. Open-ended questions (Stage 1) and interviews (Stage 2) were employed to augment the quantitative findings. The data was merged for both HEIs, as they were “categorically bound together” (Merriam, 2009 p. 49). The results from the closed questions were analysed using SPSS. The research performed comparisons between factors prior and during the pandemic by way of non-parametric testing, using the Wilcoxon

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4 Participants from Stage 1 are referred to as ‘respondents’ and participants from Stage 2 are referred to as ‘interviewees’ in Section 4 when presenting the combined findings.
signed-rank test. Responses to the open-ended questions were analysed using Atlas.ti based on deductive coding (pre-determined IT factors), as well as inductive coding for the additional factors that were identified.

**Empirical Findings and Discussion**

The questionnaire sought to ascertain the negative impact of IT factors that hindered educators’ ability to deliver a quality academic prior and during the COVID-19 environment. The factors prior to COVID-19 and during COVID-19 are contrasted in Table 2 and further detailed below.

<table>
<thead>
<tr>
<th>Table 2 IT factors hindering the ability to deliver a quality academic programme</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Mean</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Students’ internet access</td>
<td></td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>- Pre-COVID-19</td>
<td>0.0%</td>
<td>8.3%</td>
<td>8.3%</td>
<td>29.2%</td>
<td>54.2%</td>
<td>4.29</td>
<td>5.00</td>
</tr>
<tr>
<td>- Amid COVID-19</td>
<td>0.0%</td>
<td>0.0%</td>
<td>4.3%</td>
<td>30.4%</td>
<td>65.2%</td>
<td>4.61</td>
<td>5.00</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>0.17</td>
<td></td>
</tr>
<tr>
<td>2. Students’ access to IT equipment (computers, laptops, tablets)</td>
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<td></td>
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</tr>
<tr>
<td>- Pre COVID-19</td>
<td>4.2%</td>
<td>12.5%</td>
<td>8.3%</td>
<td>29.2%</td>
<td>45.8%</td>
<td>4.00</td>
<td>4.00</td>
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<td>- Amid COVID-19</td>
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<td>4.3%</td>
<td>8.7%</td>
<td>26.1%</td>
<td>60.9%</td>
<td>4.43</td>
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<tr>
<td>3. Students’ proficiency with technology</td>
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<tr>
<td>- Pre-COVID-19</td>
<td>4.2%</td>
<td>12.5%</td>
<td>12.5%</td>
<td>45.8%</td>
<td>25.0%</td>
<td>3.75</td>
<td>4.00</td>
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<td>30.4%</td>
<td>4.3%</td>
<td>30.4%</td>
<td>34.8%</td>
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<td>4. Data costs for students</td>
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<td>8.3%</td>
<td>20.8%</td>
<td>12.5%</td>
<td>12.5%</td>
<td>45.8%</td>
<td>3.67</td>
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<td>8.7%</td>
<td>8.7%</td>
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<td>43.5%</td>
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<tr>
<td>5. IT support provided by my institution</td>
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<td></td>
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<td></td>
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<tr>
<td>- Pre-COVID-19</td>
<td>8.3%</td>
<td>16.7%</td>
<td>20.8%</td>
<td>33.3%</td>
<td>20.8%</td>
<td>3.42</td>
<td>4.00</td>
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<td>30.4%</td>
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<td>26.1%</td>
<td>17.4%</td>
<td>3.30</td>
<td>3.00</td>
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<tr>
<td>6. IT training provided by my institution</td>
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<tr>
<td>- Pre-COVID-19</td>
<td>4.2%</td>
<td>25.0%</td>
<td>25.0%</td>
<td>29.2%</td>
<td>16.7%</td>
<td>3.29</td>
<td>3.00</td>
</tr>
<tr>
<td>- Amid COVID-19</td>
<td>0.0%</td>
<td>34.8%</td>
<td>21.7%</td>
<td>30.4%</td>
<td>13.0%</td>
<td>3.22</td>
<td>3.00</td>
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<tr>
<td>p-value</td>
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<td></td>
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<tr>
<td>7. Power disruptions (e.g., load shedding)</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>- Pre-COVID-19</td>
<td>12.5%</td>
<td>33.3%</td>
<td>16.7%</td>
<td>12.5%</td>
<td>25.0%</td>
<td>3.04</td>
<td>3.00</td>
</tr>
<tr>
<td>- Amid COVID-19</td>
<td>21.7%</td>
<td>34.8%</td>
<td>8.7%</td>
<td>13.0%</td>
<td>21.7%</td>
<td>2.78</td>
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<td></td>
<td>0.05 *</td>
<td></td>
</tr>
<tr>
<td>8. My internet access</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>- Pre-COVID-19</td>
<td>12.5%</td>
<td>41.7%</td>
<td>4.2%</td>
<td>20.8%</td>
<td>20.8%</td>
<td>2.96</td>
<td>2.00</td>
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<td>- Amid COVID-19</td>
<td>4.3%</td>
<td>39.1%</td>
<td>13.0%</td>
<td>17.4%</td>
<td>26.1%</td>
<td>3.22</td>
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<tr>
<td>p-value</td>
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<td></td>
<td></td>
<td></td>
<td>0.13</td>
<td></td>
</tr>
<tr>
<td>9. My access to IT equipment (laptops, tablets, printers etc.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Pre-COVID-19</td>
<td>8.3%</td>
<td>45.8%</td>
<td>12.5%</td>
<td>16.7%</td>
<td>16.7%</td>
<td>2.88</td>
<td>2.00</td>
</tr>
<tr>
<td>- Amid COVID-19</td>
<td>4.3%</td>
<td>47.8%</td>
<td>13.0%</td>
<td>21.7%</td>
<td>13.0%</td>
<td>2.91</td>
<td>2.00</td>
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<tr>
<td>p-value</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.86</td>
<td></td>
</tr>
<tr>
<td>10. My proficiency with technology</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>- Pre-COVID-19</td>
<td>16.7%</td>
<td>37.5%</td>
<td>25.0%</td>
<td>16.7%</td>
<td>4.2%</td>
<td>2.54</td>
<td>2.00</td>
</tr>
</tbody>
</table>

Non-parametric testing was also performed to compare the two HEIs, to ensure that they are comparable (bound together) (Merriam, 2009). No statistically significant differences were identified between the participants at the two HEIs, barring one IT factor (power disruptions) which is further detailed in Section 4.
The IT factors prior to, and during the pandemic are largely aligned, with small differences noted in the ranking of the mean scores as set out in Table 2. No significant differences were noted before or amid the pandemic, barring power disruptions, which is reflected further below.

The IT factors pertaining to the student element (statements 1 – 4) namely: students’ internet access, students’ access to IT equipment, students’ proficiency with technology and data costs for students had the largest impact in hindering educators’ delivery prior and during the pandemic. Even though there weren’t significant differences noted prior and during the pandemic, the qualitative comments affirm the exacerbated impact of these factors in an online environment. Specifically, one educator succinctly conveyed:

How do I impart that knowledge? How do I bridge the gap between the haves and the have nots? (Interviewee 9)

The educator went further to explain that COVID-19 “amplified” these challenges for students as “it exposed” the pre-existing challenges that “were there, but we didn't take them seriously” (Interviewee 9). This viewpoint agrees with the literature (Kaisara & Bwalya, 2022; Sturm & Pinsent-Johnson, 2021), as scholars attest to the inequalities deepening as a result of the pandemic (Azevedo et al., 2021).

In terms of the students’ specific challenges, students’ internet access (statement 1) was identified as the biggest hindrance prior and during the pandemic (mean = 4.29 and 4.61 respectively). Furthermore, this hindrance amid the pandemic was reaffirmed in the qualitative comments. Educators conveyed that the increased use of online platforms and the internet created an issue for students in terms of reliability (Interviewees 1, 2, 3, 4, 8, 10), as the internet is not “that reliable in all the corners of the country” (Interviewee 1; also conveyed by Respondent 18) and some students “come from faraway places, where they do not have, connectivity. It's actually a big issue” (Interviewee 4).

Students’ access to IT equipment (statement 2) was the second biggest hindrance prior and during the pandemic (mean = 4.00 and 4.43 respectively). The qualitative comments endorsed the negative impact of this IT factor as educators noted the absence of tablets, laptops and sometimes even a smartphone for students (Respondent 8; Interviewees 1, 2, 6, 8). The absence of suitable devices negatively impacted students’ ability to access online content, attend online classes and conduct online assessments amid the pandemic (Interviewees 2, 6).

The absence of suitable devices placed serious constraints on the educators’ teaching in an online environment (Interviewees 2, 8), as students often resorted to using their mobile devices for online activities (classes, tutorials, working through course content, assessments, etc.) (Interviewees 1, 2, 6, 8, 9). The use of mobile phones to conduct online activities is similarly evident in the literature (Kaisara & Bwalya, 2020). Educators, therefore, conveyed that “online activities would be easier for students if they have more suitable devices”, referring to tablets, laptops, or smartphones.
(Interviewee 2), as these types of devices can be used to log onto Microsoft Teams (Interviewees 6, 8). The lack of access to suitable electronic devices also made it difficult for students to complete assessments, as “cell phones have their own limitations” (Interviewee 6).

For statement 3 (students’ proficiency with technology), the mean score decreased slightly from before to during the pandemic (mean = 3.75 and 3.70 respectively). Educators noted that “students’ level of computer literacy is very low” (Respondent 24). Moreover, with regards to during the pandemic, another educator remarked that “student's proficiency or unwillingness with technology hinders them from accessing material uploaded on Moodle”, which concomitantly impacts the delivery a quality academic programme (Respondent 2). Furthermore,

Then lecturers, they can get the system, but the students themselves didn't have enough time to phase them into this world. (Interviewee 9)

For the last IT factor pertaining to the student element, namely students’ data cost (statement 4) the mean score increased slightly from before to during the pandemic (mean = 3.67 and 3.91 respectively). This hindrance during the pandemic was largely observed in the qualitative comments from educators, and the concomitant impact on the delivery of the academic programme (Respondents 2, 8, 14, 15, 18, 25). Educators conveyed that data is expensive (Respondent 25; Interviewee 1), which often results in students missing live online classes amid the pandemic, as they can only access data in the evenings (non-peak times) (Respondent 25; Interviewees 1, 8).

A lot of students complain about the data being expensive, then they don't attend the day classes and they opt to listen to the recordings, in their own time, which I assume will be, after 12, because then usually most network providers give you free data to use around those times. (Interviewee 8)

The remaining IT factors (statements 5 – 10), either pertained to the educators’ digital divide (statements 8, 9 and 10), areas that impact the digital divide of students and educators given the support offered by the HEI (statements 5 and 6) and lastly power disruptions (statement 7) that impact educators and students in accessing IT platforms. These IT factors generally had a moderate negative impact on educators’ delivery of the academic programme, as mean scores of less than 3,50 were observed. However, most of the statements were supported by qualitative comments also point to the negative impact of these IT factors on the delivery of the academic programme.

For statement 5, IT support provided by my institution, the mean score decreased slightly from before to amid the pandemic (mean = 3.42 and 3.30 respectively). The negative impact of this IT factor amid the pandemic was observed in the qualitative comments, as educators noted that support from IT only became available a few months into the COVID-19 pandemic (Interviewee 6). Furthermore,

It was a little bit delayed, and I think because we were sort of at a backlog. So, there were all these different platforms that were being presented to us in Teams, Zoom, some different functionalities within the Moodle platform itself, and then these YouTube videos and you were kind of at a loss for what exactly to do. (Interviewee 3)

For statement 6, IT training provided by my institution, the mean score decreased slightly from prior to during the pandemic (mean = 3.29 and 3.22 respectively). One educator remarked that they were being “trained on the job” amid the pandemic (Interviewee 9).

[…] you go to a session today on how to set a paper online and then tomorrow you've got a test. So, the online learning experience, the transition, there was no transition. (Interviewee 9)
While another educator reflected on the lack of student training amid the pandemic.

Lack of support from institution to students in IT knowledge. (Respondent 21)

Educators also commented on the negative impact of IT training prior to the pandemic noting the […] lack of formal training in recent developments in IT. Employer did not show any willingness to support attendance to IT CPD training programmes. (Respondent 6).

Furthermore, one educator specifically referred to the difficulty of using IT platforms in large classroom environments prior to the pandemic.

IT support was hindering ideas on how to convey class in a more inclusive environment. The university did not have the adequate facilities to do this exercise in an inclusive environment for a large class. (Respondent 13)

For statement 7, power disruptions, the mean score decreased slightly from before to amid the pandemic (mean = 3.04 and 2.78 respectively), with a statistically significant difference (p = 0.05). A statistically significant difference was also observed between the two institutions (p = 0.001). This provides context for South Africa’s electricity reliability and supply challenges. South Africa is plagued by frequent electricity disruptions as the state-owned entity, Eskom – which supplies more than 90% of the country’s electricity – rations electricity consumption through load shedding (Ateba, Prinsloo & Gawlik, 2019). Namibia also faces certain unique electricity supply challenges, as it imports more electricity than it generates. However, unlike South Africa, NamPower – Namibia’s national power utility – had 0% load shedding for 2020 (NamPower, 2020). On the other hand, Eskom implemented 46 days of load shedding in 2020, which is an increase from the 30 days in 2019 (Eskom, 2020).

For statement 8, my internet access, a slight increase in mean score was observed from prior to during the pandemic (mean = 2.96 and 3.22 respectively). However, the negative impact amid the pandemic was also observed in the qualitative comments.

We were kind of on our own at home and there were just these expectations for you to just continue delivering. I had to buy my own data, I never had WiFi at home, I never saw the need for it. (Interviewee 5)

Furthermore, it was conveyed that educators did not receive support in terms of data provision (Interviewees 5, 10) and had to make use of their own resources for data and internet access (Respondent 4).

For statement 9, my access to IT equipment, a small increase in mean score was noted from 2.88 to 2.91 from prior to amid the pandemic respectively. In the qualitative comments, educators merely noted that they had access to devices (laptops) during the pandemic and they could continue teaching online (Interviewees 6, 8).

Lastly, for statement 10, my proficiency with technology, there was a slight increase in mean score from prior to during the pandemic from 2.54 to 2.61 respectively. Certain educators remarked about their proficiency in terms of technology amid the pandemic (Interviewee 9).

Initially I was using Zoom and later the university invested in a Microsoft Teams license, and we moved all our classes to Microsoft Teams. I did not experience any issues with technology, as academics we managed to unlock the underutilized technological tools that we have at our disposal. (Respondent 7).
While another noted that educators showed “some resistance to going online because” they “didn’t really understand” (Interviewee 3) or they were not aware of the various functionalities contained within previously used online platforms.

[...] most of us we were not sure of what we were supposed to do. Yes, we did have Blackboard, I think we now moved on to Moodle, we did have all these things, but we were not using them. That's the issue. So, most of us were not prepared. (Interviewee 4)

A hindrance for their proficiency with IT technology amid the pandemic was noted in the terms of assessments by several educators (Interviewees 1, 4, 7, 8, 9).

There was a problem with assessment because we didn't know how to set up assessments for online. (Interviewee 1)

An additional IT factor that came to the fore in the qualitative comments was the “inefficient investment in IT infrastructure” at their institution and nationally amid the pandemic (Respondent 5). This was echoed by another educator:

IT infrastructure was not ready to handle such a sudden huge volume. (Respondent 23)

Another educator added that the institution lacked funds in terms of online assessments.

Our institution could not, due to a lack of funds, invested in the latest technology regarding online assessments. (Respondent 25)

For the period, prior to the pandemic, another educator provided more context to the IT impediments at the HEIs by remarking that the WIFI at their institution often causes “disruptions due to increased usage” which makes “it difficult for students and lecturers alike in the teaching and learning activities” (Respondent 15).

The additional comments provided indicate the importance of governments’ fiscal policies supporting IT investment (Mhlanga & Moloi, 2020) at universities and for communities at large. IT hindrances were similarly observed by educators in this study, as students were not able to successfully partake in online learning from their homes, but also that the universities infrastructure is not well resourced in this regard (Respondents 15, 25).

Overall, the biggest IT hindrance to educators’ delivery of the academic programme (prior and amid the pandemic) were the student element namely: students’ internet access, students’ access to IT equipment, students’ proficiency with technology and data costs for students. Moreover, the qualitative comments from participants mainly pertain to the period amid the pandemic and provide evidence of the exacerbated problem of a fully online environment for students who experience the digital divide, which concomitantly impacts educators’ delivery of the academic programme. Thus, the knowledge gap will continue to widen between developed and developing countries, given the digital divide experienced by students (Mpungose, 2020).

Conclusion, Limitations and Areas for Future Research

The objective of this paper was to ascertain the negative impact of IT factors, prior and during the pandemic, to provide context to the higher education environment. The context could aid future teaching practices to assist educators in achieving agency (Biesta, 2015; Priestley et al., 2015), for “inclusive and equitable education” for all (United Nations, 2015). The findings reveal that the adoption of online learning by HEIs, face a number of challenges for developing countries within the SADC. Interestingly, no significant differences were noted between the IT factors prior and during the pandemic (barring power disruptions). Most notably, the IT factors pertaining to the
student element, namely: students’ internet access, students’ access to IT equipment, students’ proficiency with technology and data costs for students had the largest impact in hindering educators’ delivery prior and during the pandemic. The IT factors negative impact were mostly also intensified amid the pandemic. As succinctly conveyed by one educator, the COVID-19 pandemic “amplified” these challenges for students as “it exposed” the pre-existing challenges that “were there, but we didn't take them seriously” (Interviewee 9). This comment is equally evident in the literature (Azevedo et al., 2021).

What does the negative impact of these IT factors mean for educators in terms of their agency? The agency theory emphasizes that educators must act by means of their environment (Priestley et al., 2015). Consequently, educators need to aware of the negative impact of the IT factors to bring about empowerment and change to their teaching practices (Biesta, 2015; Priestley et al., 2015). The digital divide needs to recognized by educators otherwise the “existing social inequalities will prevail” (Sturm & Pinsent-Johnson, 2021, p. 78). Therefore, educators need to find ways to deliver the academic programme to students regardless of the context (digital divide), as online learning is the best way to continue learning amid a social disruption such as that caused by the COVID-19 pandemic (Adnan & Anwar, 2020). Failure to address the various challenges within an online environment could ultimately lead to the detriment of students learning in this new post COVID higher education environment (Tharapos, 2021).

This requires educators to rethink instructional strategies, and forms of assessment (Tharapos, 2021) in light of the digital divide experienced in developing countries. Educators need to be creative and flexible in achieving quality within a constrained higher education environment (Priestley et al., 2015). This calls for collaboration and robust debates among educators (Tharapos, 2021) on how to sustain teaching and assessment under all conditions.

Educator agency, however, does not negate the responsibility of the state and HEIs. The knowledge gap will continue to widen between developed and developing countries if access to knowledge is not addressed (Task Force, 2000). Mhlanga and Moloi (2020) specifically call for the government of South Africa to invest in online learning and the adoption of 4IR technologies. HEIs also have a role in developing educators in terms of IT training to sustain teaching under all conditions, as evidenced by educators constraining their ability to deliver a quality academic programme. Taken together, the negative impact of the IT factors prior and during the pandemic should inform redress in government, HEIs, but also educators in terms of their teaching practices.

Overall, the study makes a contribution to the literature by providing context to the higher education environment on IT factors that negatively impact educators in the delivery of the academic programme. Firstly, this study provides context to the environment by indicating that the student element pertaining to the IT factors most adversely impact on educators’ delivery. This study also revealed that there are no significant differences between the IT factors prior and during the pandemic. However, prior to the pandemic, these IT factors were not taken seriously given the nature of the the contact-based academic programme. However, these IT factors came to the fore in a fully online environment and should thus be part of educators future agency.

Despite these contributions, this study is not without limitations, the main one being the research setting of the COVID-19 pandemic. The relatively small sample data limits the generalisability of the results. However, this study was purposefully designed with a small number of participants to generate a rich and detailed understanding of the perceptions of educators employed at HEIs in the SADC during the pandemic. As previously detailed, other SADC countries experience even lower internet penetration rates than Namibia and South Africa (Internet World Stats, 2022). These IT factors may, therefore, have an even greater negative impact on educators’ delivery from other SADC countries. Future research could investigate ways in which educators can bring about redress
in their teaching practices, despite the context of the digital divide, to ensure that students are not left behind and equitable education is provided to all (United Nations, 2015).

Far from being just a disruption, the pandemic is an indication of the urgent need to build sustainable HEIs for educators to deliver quality academic programmes to assume their intellectual responsibility toward society. This study obtained an understanding of IT factors (past and present) that may hinder educators’ orientations towards the future. Bringing to the fore the IT hindrances, educators can act by means of their environment, to enable teaching to continue under all conditions.

References


