Digital Divide: Secondary School Learners' Experiences of Using Educational Technologies

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Abstract

In the wake of COVID-19, most secondary schools in South Africa and Lesotho were forced to fully migrate to and adopt educational technologies (Ed-Tech) for teaching and learning. The gunpoint use of the Ed-Tech showed that learners do not have access and are struggling to use Ed-Tech because of the digital divide (DD). Consequently, this mixed methods study informed by pragmatism sought to explore learners' experiences of using Ed-Tech in the face of digital divide. Thirty-five learners were randomly selected to respond to the questionnaire. Thereafter, ten learners were purposively and conveniently sampled to participate in Zoom semi-structured interviews and e-reflective journals for data generation. As such, the study was framed by the resources and appropriation theory, and data were quantitatively and qualitatively analysed. Findings suggest that lack of preparation by schools on the use of Ed-Tech perpetuated first level DD (material access and Internet connection), second-level DD (technological skills and usage) and third-level DD (benefits of technology). The study thus recommends both theoretical and practical initiatives by secondary schools in Lesotho and South Africa to address and curb digital divide in order to effectively use Ed-Tech and allow all learners access to high quality education.

Keywords: COVID-19, Digital divide, Educational technologies, Experiences, Material access, Secondary school

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Introduction

The eruption of coronavirus pandemic in March 2020 in Africa and the subsequent lockdown restrictions forced most schools worldwide to migrate to and adopt the use of Ed-Tech to teach online (Selwyn 2021; Treve 2021). Since then, the rapid use of Ed-tech has completely changed the manner in which teaching and learning is conducted in schools (Dube 2020; Jansen 2019). Ed-tech now plays an enormous role in the success of teaching and learning in schools (Prensky 2001). This is witnessed through the adoption and the use of various Ed-tech, ranging from software (SW) resources such as learning management systems (LMS) (Moodle, Canvas, Blackboard and inter alia), social media sites (SMS) (Facebook, WhatsApp, YouTube and others), video communication technologies (VCT) (MS Teams, Zoom, Television inter alia), and hardware (HW) resources such as laptops, tablets, smartphones inter alia (Ansaldo 2020; Bates 2016; Selwyn 2021). This rise in the use of Ed-Tech requires both teachers and learners to have pedagogical knowledge on the use of such resources to enhance flexibility (teaching not fixed in a classroom), reduce cost (transport), and ensure connectedness (remote learning). However, access to Ed-Tech is seemingly unequal, owing mostly to socio-economic factors (Makumane 2021; Mpungose 2020). The unequal access bolsters digital divide (DD), which according to van Deursen and van Dijk (2021), is digital inequality of material access, skills and usage of Ed-Tech. DD remains the barrier in enjoying the benefits of online learning (e-learning) particularly in developing countries in Africa, Brazil and others as compared to developed countries from Europe, Australia and the United States of America (Koehler, Shin & Mishra 2012; van Deursen & van Dijk 2021).

The literature shows that almost all under-resourced schools in South African and Lesotho remained closed during the lockdowns periods because of many factors (geographical area, social class, social-economic background and others) which determine the level of DD (Dlamini & Nkambule 2019; Makumane & Fru 2021). Consequently, according to Dube (2020), some schools did not finish the syllabus hence both teachers and learners were still battling because of the intensity of the factors which led to the DD. This suggests that schools located in geographical areas without Internet access; where there was a high rate of unemployment, lead to inability to afford Ed-tech resources (laptops, computers, data bundles and others). Thus, these

schools were inhibited in terms of accessing e-learning, particularly in the context of coronavirus pandemic. Internet access is considered to be a tool that promotes personalisation (personal need), sociali-sation (societal need) and professionalisation (education/ subject need), especially in the pandemic era, where physical contact is barred/ limited (Sokhulu 2021; van Deursen & van Dijk 2021). Thus, having no access to the Internet perpetuates DD as some individuals do not have any means to have access to it, especially in Sub-Saharan countries such as Lesotho and South Africa, due to exorbitant costs and network challenges, lack of re-source access, which includes, but not limited to, HW and SW resources (Tamrat & Teferra 2020).

Seemingly, research shows that various programmes and policies have been developed and implemented to remedy this challenge of digital divide in South African and Lesotho schools (Blignaut 2009; Martindale 2002). This is done through providing selected schools with free laptops and Wi-Fi access and free data bundles, inter alia (Cafun & Ramrathan 2021; Jansen 2019). However, little or no research has been done to intervene in addressing learners' challenges (DD) that hinder them from accessing e-learning from home. This study aims to explore learners' experiences of using Ed-Tech in the face of digital divide to project a practical and a theoretical solution. In proposing alternative pathways for South African and Lesotho schools to deal with the DD, this study considers a resources and appropriation theory to theorise the learners' experiences of using Ed-Tech in the face of digital divide.

Theorising the Learners' Experiences of Using Ed-Tech in the Face of Digital Divide

The Internet has proven to be indispensable during the uncertainty, as it gives a sense of continuity in the teaching and learning process. van Deursen and van Dijk (2021) attest that the Internet permits flexibility in sharing information and experiences virtually, especially in times of crisis. Thus, the use of e-learning proved to be a viable solution to salvage the process of teaching and learning for knowledge acquisition through the use of Ed-Tech (Khoza 2021; Mpungose 2020). However, gunpoint use of Ed-Tech evidenced digital inequality, as learners had unequal access or no access to HW and SW resources. Seemingly, 'COVID has shown us how unequal we are. When we went into hard lockdown last year, the kids in the fancy schools (well-

resourced schools from quintile 4 and 5) went straight from face to face to online. The children from poorer schools (poor-resourced schools from quintile 1, 2 and 3) were cut off immediately […]' (Jansen 2021: 1). The latter assertion denotes that the uncertainty perpetuated DD, as digital inequality became glaringly evident amongst learners from different social backgrounds in developing countries.

In addition to the above, DD can be seen both in a broad sense: as unequal access to resource access and connectivity (computers, smart phones, tablets, Internet, inter alia), and in a narrow sense: as limited or no access to additional resources that permit people to effectively use technology (Büchi 2021; Warschauer 2002). This social division in the use of Ed-Tech implies a chain of causality that translates into unequal access to quality education, with some learners benefitting more than others (van Deursen & van Dijk 2021). This latter assertion alludes to marginalisation in e-learning exacerbated by socio-economic factors, and this was particularly evinced by the novelty, which forced a hasty paradigm shift (Blignaut 2009; Sokhulu 2021).

In theorising the DD experienced by learners in the context of COVID-19 in both South Africa and Lesotho, the resources and appropriation theory by Van Dijk (2005), which analyses access and addresses issues of inequalities in Ed-Tech usage, seemed to be an appropriate framework in this context. According to Van Dijk (2017) and Khoza (2021), this theory is hinged on five key principles as depicted in table 1. Below.

Table 1: The resources and appropriation principles

The resources and appropriation theory principles
1. Categorical inequalities in society produce an unequal distribution of resources;
2. An unequal distribution of resources causes unequal access to educational technologies

3. Unequal access to educational technologies also depends on the characteristics of these technologies
4. Unequal access to educational technologies brings about unequal participation in society
5. Unequal participation in society reinforces categorical inequalities and unequal distributions of resources

The theory of resources and appropriation question the aspect of inequalities that lead to DD in the society, particularly in educational institutions. This is evidenced when van Deursen and van Dijk (2021) argue that '…categorical inequalities in society produce an unequal distribution of resources and that an unequal distribution of resources causes unequal access to the Internet…' This latter assertion denotes that access to the internet by learners is realised through the process of appropriation that seeks learners' general attitudes toward the Internet and advances to having physical and material access (Van Deursen & Helsper 2015).

In other words, the social and technological context in which internet is used by learners influences the process of appropriation. Thus, van Deursen and van Dijk (2021) further assert that learners' social context can result in personal and positional inequalities which lead to unequal distribution of resources. This suggests that personal categorical inequalities as a result of learners' age, gender, identity, passion and other personal aspect on the use of Ed-tech may lead to the DD. For instance, some schools may forbid learners from having or bringing smartphones in class because of their age or gender, and this may lead to DD. Similarly, the positional categorical inequalities as a result of socio-economic status of the family from which the learners hail from, also contribute to DD (Van Deursen & Helsper 2015; van Deursen & van Dijk 2021). For instance, a learner from an employed family may easily access HW connected to the Internet because they can afford to buy a learner the relevant Ed-tech resources, as compared to the learner coming from a disadvantaged family.

Furthermore, Van Dijk (2017) alludes that unequal access to Ed-Tech also depends on the characteristics of these technologies. In other words, the characteristic of a particular Ed-Tech resource may lead to unequal access by learners. For instance, few learners may enjoy the benefits of using Ed-Tech from Apple brand name because it is seemingly more advanced and expensive than other Ed-Tech brand names like Android, and this has a potential to enhance DD. As a result Van Dijk (2005), as well as van Deursen and van Dijk (2021) confirm that having unequal access to Ed-Tech brings about unequal participation in society. This suggests that not all learners can participate equally in the process of teaching and learning if there is unequal access to Ed-Tech resources. Hence, unequal participation in society reinforces categorical inequalities and unequal distributions of resources. This suggests that learners' socio-economic inequalities compound DD, and this affects attitudinal access (one's attitudes/motivation towards Ed-Tech), material access (devices used), skills access (skills necessary), and usage access (time and activities) (van Deursen & van Dijk 2021). Consequently, this study argues for both theoretical and practical initiatives by secondary schools in Lesotho and South Africa to address and curb digital divide in order to effectively use Ed-Tech and allow all learners access to high quality education.

Van Deursen and van Dijk (2021) outline that the first level DD denotes differences in material access and Internet usage, and an unequal distribution of resources that support the use of Ed-Tech. In other words, material access, or lack thereof, translates into injustices in the process of knowledge building as individuals who are well-off have an advantage over those who are socio-economically disadvantaged as they have device opportunity, device and peripheral diversity and maintenance expenses (Warschauer 2002). Moreover, The second level DD concerns technological skills and usage, which is informed by different contexts where technological knowledge is required (Makumane & Fru 2021). That is, the skills and usage access talks to the requisite skills to effectively use Ed-Tech for knowledge building and the time spent on and activities involved in using these particular technologies (Van Deursen & van Dijk 2019 2021). Lastly, the third level DD subscribes to observable benefits of using Ed-Tech, through observable outcomes (Van Deursen & van Dijk 2019). This suggests that this level is reliant on social user environments which contribute to individualised interactions with the technological environment to find appropriate learning

approaches. Makumane (2021) asserts that this interaction may augment or hamper the learning process through Ed-Tech, depending on access to device opportunity and diversity. In other words, the issue of access remains the solution to curb the DD in secondary schools. As such, Van Dijk (2005) demonstrates four key aspects of successive kind of access to Ed-Tech as indicated in the figure below:

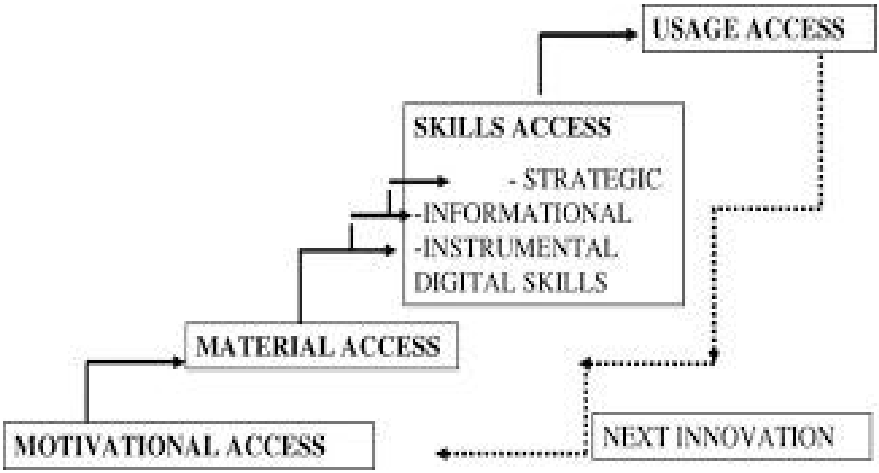

Figure 1: Successive Kinds of Access in the Appropriation of Ed-Tech, Adapted from Van Dijk (2005).

Following, Van Dijk (2012) posits that to appropriate Ed-Tech for equal access, learners should be sufficiently motivated and have a positive attitude to use it. This suggests that, motivation, love and passion remain key principles in Ed-Tech access by learners. In other words, the context of the COVID-19 pandemic requires learners to draw from their motivation towards the use of Ed-Tech (Chisango & Marongwe 2021). In addition, learners need to have physical and material access of HW and SW resources (computers, smartphones, Internet, inter alia), and to also have appropriate skills to use them. These skills would result in appropriate usage that would be apparent in the observable outcomes (Van Deursen & van Dijk 2019 2021). This theory is further explicated in the proceeding section, which presents literature review.

The Review of the Literature

DD as a concept has been a subject of scrutiny, especially in the context of the uncertainty, where the use of Ed-Tech proved to be requisite (Dlamini & Nkambule 2019; van Deursen & van Dijk 2021). 'The concept of digital divide is usually defined as the gap between people who do and do not have access to forms of information and communication technology' (Van Dijk 2017: 1). In other words, DD as a concept denotes a visible gap, perpetuated by the use of Ed-Tech, between individuals who have, and those who do not have access to technology, especially in the face of a pandemic that has an exigency of forceful use of Ed-Tech. Previously, the term DD was broadly defined as disparity between people and the access to the internet, but from 1990s onwards, the term was narrowly defined as disparity between people and access and the use of information and communication technology (Ed-Tech) (Van Dijk 2017). Further, Norris (2001) alludes that DD can exist in both developed and developing countries irrespective of the geographical or socio-economic status. The latter assertion suggests that DD occurs once there is unequal access in the use of Ed-Tech, particularly during teaching and learning, which curtails the quality of education afforded to learners from different backgrounds.

Seemingly, access and the use of Ed-tech resources (HW and SW), internet, data bundles, and having technological skills needed to effectively utilise Ed-Tech proved to be a scarce commodity to some learners, especially those coming from disadvantaged backgrounds in developing countries (Tamrat & Teferra 2020; UNICEF 2021). As such, Wangenge-Ouma and Kupe (2022) proclaim that the uncertainty on the access and the use of Ed-Tech resources came and realised at the time when South Africa is festering in the marsh of unsustainable inequalities, notably in the basic education system, due to a hasty and ill-prepared paradigm shift. For instance, in a South African context, schools from rural/remote areas did not even finish the syllabus during the start of the COVID-19 pandemic (which demanded the shift from face-to-face to e-learning) as compared to schools from urban areas, due to difficulties on Ed-tech access and use. Consequently, these studies (Mpungose 2020; Wangenge-Ouma & Kupe 2022) attest that access to and the use of Ed-Tech resources to enhance e-learning in the South African context is hampered by various issues which may include, but not limited to, socio-economic factors, race, social class, geographical area, age,

gender and educational background. In other words, these factors lead to DD, as marginalisation in terms of access and the use of technological resources, particularly during teaching and learning, becomes glaringly evident. For instance, DD is witnessed when learners from rural schools in particular can hardly access, and do not have skills to effectively use Ed-Tech for knowledge building during teaching and learning process. This unequal access and lack of skills aggravates the three levels of DD as there are injustices in equal material access (first level DD); lack of skill and usage (second level DD); which in turn hampers observable outcomes (third level DD) (Norris 2001; van Deursen & van Dijk 2021). This is evident when Maree and Vos (2021) affirm that private schools and schools located in opulent areas had no problem adopting blended learning and using Ed-Tech, as opposed to schools located in impoverished and resource-scarce areas, which grappled to make a transition to e-learning because of not having access to Ed-Tech resources, lack of skills and outcomes were not achieved.

In the Lesotho context, Mbambo-Thata (2020) asserts that DD, which is sometimes intensified by extortionate data costs, hinders access to learning in digital spaces. This assertion is substantiated by Makumane (2021) who certify that disparate access to HW, SW and ideological ware (IW) resources socially, personally, and professionally divides learners, and this translates into the use of ED-Tech compromising learners' subject societal and personal needs. As such, Mashinini (2020) as well as Mbambo-Thata (2020), posit that schools should ensure that all learners, including those who are economically disadvantaged, have equal access to connectivity, digital devices and data in order to promote effective use of Ed-Tech. However Kali and Das (2021) concur with Maree and Vos (2021) that there is lack of access to Internet facilities and computers, and this is worsened by low internet penetration and highly unaffordable data costs particularly in rural schools. This suggests that DD in this context, is perpetuated by lack of Internet access and Ed-Tech hardware resources, which hampers sharing of information for personal, social and subject (professional) needs. Lack of Internet access, according to Alexander van Deursen and van Dijk (2021), affects successive kinds of access to material, skills and usage access. In other words, DD, which is compounded by socio-economic inequalities, seemingly negatively affects motivation to use Ed-Tech, especially if such technology is a forceful imposition on individuals with lack of material access, skills and usage.

Nowadays, both developing and developed countries seek to create schools in which all learners can access, use and share Ed-tech resources in order to narrow the DD gap. As such, In United states of America, Federal Communications Commission (FCC), has been introduced in curbing the digital divide in American schools; European Union introduced the term 'e-inclusion' introduced with the commitment to reducing the digital divide; and South Africa, the national development plan aims to reach lower levels of DD by 2030 (Jayakar 2004; National Development Plan 2030). Such initiatives are set to reduce the DD within and among the members of the community including learners at large. In contrary, this has not yet been achieved or realised particularly in rural schools. This suggests that there are still significant differences between individuals, groups, regions and countries in terms of reaching and sharing Ed-Tech resources. Consequently, Van Deursen and van Dijk (2019) and Kali and Das (2021) aver that in order to appropriate Ed-Tech usage during/post the pandemic, these four phases (attitudinal access, material access, skills access and usage access) of appropriation need to be embraced in order to enable equal distribution of resources. As such, learners can be afforded with equal access to Ed-Tech. It is against this background that this study explores missing solutions, both theoretical and practical, that could curb DD and allow all learners particularly in South African and Lesotho secondary schools, to have access to high quality education.

Research Design and Methods

Research Objective and Research Questions

In exploring learners' experiences of using Ed-Tech in the face of digital divide, our study addressed the following main research questions:

- What are learners' experiences of using Ed-Tech in the face of digital divide?
- What informs learners' experiences of using Ed-Tech in the face of digital divide?

Research Context, Design and Paradigm

The exploration of learners' experiences occurred in the context of two se-

condary schools, one in South Africa (SA) and one in the Lesotho (L). In 2021, the Mellon Foundation project explored academics, teachers and learners' experiences on the use of Ed-tech in a South African context. In 2022 the project was extended only on learners' experiences on the use of Ed-tech in the Lesotho context. The South African school system offers learning from grade R (first grade at school) to grade 12 (last grade at school). Various subjects are offered ranging from languages, science subjects, engineering subjects and others. They are mainly taught in face-to-face environment as compared to online environment. In contrast, in Lesotho context, according to Gillwald, Mothobi, and Rademan (2018: 1), 'about 83% of the rural population cannot connect to the internet, while only 50% of the urban population uses the internet'. This suggests that most of the schools in Lesotho are located in rural areas as compared to urban areas. The schooling system also start from grade R to Grade 12, and is organised in terms of early childhood care and development (ECCD), primary school (grades 1-7), junior secondary (grade 8-10), and senior secondary (grade 10-12). The study used a case study design to explore learners' experiences in order to generate rich data and have an in-depth understanding of experiences from multiple cases (SA and L) (Creswell & Poth 2017; Yin 2013). As such, this design was chosen because it is more expressive and allowed us to give an in-depth description of learners' experiences from both cases. The study adopted a mixed-method approach guided by the pragmatic paradigm in exploring learners' experiences on the use of Ed-Tech resources. Pragmatists do not see any differences in inquiry methods other than as mere 'ways of helping us cope with aspects of the world …' (Badley 2003: 300) and it is not restricted to any specific research method and literature (Creswell & Poth 2017). That said, pragmatism allowed learners to reflect on their past and present experiences of the use of Ed-Tech resources learning in the face of DD, in order to shape their future experiences. This paradigm gave us an in-depth understanding of learners' experiences and what informs them in their use of Ed-Tech resources in the face of DD, in order to propose both practical and theoretical solutions to curb the DD in both contexts (South Africa and Lesotho).

Selecting Focal Learners

In recruiting learners to participate in this study, both electronic flyers and

organised information sessions were developed for recruitment purposes. We sought out accessible and purposive students by using convenient and purposive sampling (Creswell & Poth 2017; Yin 2013). After getting their consent, a total of 35 students were randomly selected because they were enrolled in grade 8 to 12 in two secondary schools (SA = 19; L = 16). However, 10 learners (SA = 4; L =6) were purposively and conveniently selected based on the premise that they are from disadvantaged family backgrounds in order to share their subjective experiences on the use of Ed-Tech resources. We originally had 35 students, but two students from the SA case and one from the L case withdrew their participation and we ended up having 32 participants.

Catching Learners' Experiences in SA and Lesotho

On the one hand, all 32 learners were given survey questionnaires to give answers to open-ended questions with first objective of getting an understanding of learners' experiences of using Ed-Tech for learning in the face of digital divide (Cohen, Manion & Morrison 2013). On the other hand, 10 learners partook in Zoom semi-structured interviews and e-reflective journals in order to address the second objective, which is to illustrate the reasons that inform their experiences (McMillan & Schumacher 2006). Moreover, e-reflective journals with a short series of questions was emailed to 10 students to reflect on their use of Ed-Tech resources and this was completed within a month in each case. In addition, Zoom semi-structured interviews were administered for both cases a period of two months, and each interview lasted for an hour while recorded. These multiple sources of data generation were administered for the purposes of triangulation, in order to ensure achievement of authenticity and trustworthiness (transferability, dependability, confirmability, and credibility) of the generated data (Creswell & Poth 2017; Yin 2013).

Data Analysis and Trustworthiness

Thematic data analysis was utilised following both inductive and deductive reasoning to make sense of the data generated from learners through coding to form categories and themes (Cohen *et al.* 2013). Data generated were recorded directly and openly coded from the recorded source in order to

avoid weakness of data analysis through loss of meaning during transcription. Deductive reasoning assisted us to map the codes into categories set from the theoretical framework and the literature, in order to form themes. We used an inductive process to capture any remaining codes which were not deductively analysed during the prior analysis, to form categories. After using these processes as a guide, categories were focused and sharpened to form four themes (attitudinal access, material access, skills access and usage access).

Presentation and Discussion of Findings

The findings of this study are presented in themes that were pre-determined as guided by principles of the resources and appropriation theory (deductive reasoning) and those that emerged during our interaction with data (inductive reasoning). Findings are thus presented in a narrative form for purposes of trustworthiness, in view of preserving the truth value of data being discussed (Butina 2015). The four main themes are motivation, physical and material access, Ed-Tech skills, and usage. Findings presented are those of 10 conveniently sampled participants as they represented the 32 purposively sampled participants. In other words, these 10 participants' experiences were representative of the 32 participants.

Theme 1: Motivation

Theme one emerged from participants' responses in the questionnaires, reflective journals as well as semi-structured interviews. Responding to the question: what do you think of the use of Ed-Tech in your school, participants displayed discomfort in using these technologies, and this was more evident during semi-structured interviews. One participant in Lesotho (L6) said in an interview, 'I do not like using 'these things' because I am not used to them'. Similarly, a participant from South Africa (SA3) also responded, 'I hate social media sites because it exposes my personal life and it distracts my daily routine on school work …'. Noteworthy to mention, most participants (SA1, SA4, L1, L2, L4, L5) were of the same view as L6 and SA3 in their reflections. These assertions are seemingly double-headed: firstly, the participants displays demotivation and discomfort on using Ed-Tech, which may translate into technostress which according to Khoza and Biyela (2020)

is experienced when digital refugees (those who needs training before Ed-tech use) are forced to use technologies that are 'alien' to them. Consequently, Chisango and Marongwe (2021) further aver that psychological factors affect motivational access, and these include technophobia and stress brought about by the gunpoint use of Ed-Tech. This suggests that the lack of love and passion can hinder motivational access to the use of Ed-Tech resources, and this may lead to the DD. Secondly, the 'I do not like using them' statement seemingly unearths a negative attitude towards Ed-Tech as the participant apparently feels intimidated by the proposed use of technology, which may adversely impact the perceived outcomes. As such, Van Dijk (2020) insists that for an individual to appropriate Ed-Tech usage, they should be motivated to use it. Thus, learners' experiences from both cases (SA and L) displays an unfavourable attitude towards Ed-Tech use, which can have implications on the willingness to use it, and in turn reveal a domino effect that affects the other kinds of access that contribute to the appropriation of Ed-Tech in the process of knowledge building. As a result, Valtierra and Michalec (2017) argue that motivational access should start from within the personal identity of a learner where love passion, self-esteem, and self-rationale should be the drive on the use of Ed-Tech. This suggests learners should not be forced to use Ed-tech resources but they need to be self-motivated to have love of using any Ed-Tech at their disposal for teaching and learning in order to curb DD.

Conversely, SA2 expressed enthusiasm over the use of Ed-Tech saying, 'I get excited knowing that computers are becoming a part of my everyday life, although I only get to use them when I am at school, and only when they are available as there are a lot of us who use them in the computer lab'. SA2's statement alludes that she is open to using Ed-Tech resources and has a positive attitude towards it. Notably, the issue of lack of material access is evidenced by the latter part of her statement, and this is explicated further in the next section. SA2's assertion was supported by L3, who posited in his reflective activity that, 'I like learning new things, and because we are in the digital age, I am really happy we get to use technology to learn'. This affirmation denotes that this participant embraces the use of Ed-Tech as it is considered a viable way towards knowledge building during/post the uncertainty (Khoza 2021; Sokhulu 2021). Chisango and Marongwe (2021) attest that learners who espouse Ed-Tech are in a position to appropriate technology and this motivates effective usage in order to avoid DD. These

findings demonstrate a conundrum in the use of Ed-Tech, wherein some learners fully embrace its use, while others repudiate its usage on the basis of lack of motivational access, especially when such access is seemingly foisted on their personalisation, socialisation and professionalisation 'norm', while further being exacerbated by the uncertainty. This conundrum can be resolved when positive attitude (love, passion and self-esteem) supersede the unfavourable attitude (denial, resistance and technostress) (Michalec 2013; Mpungose 2020). Hence, the unfavourable attitude, to all intents and purposes, has a bearing on physical and material access.

Theme 2: Physical and Material Access

This theme was the most prevalent as it was embedded in most of the statements uttered by participants. For instance, SA6's statement on the aspect of motivation above also hinted on the issue of physical and material access: 'I do have a smartphone but I only get to use a laptop/ computers when I am at school in the computer lab'. Moreover, L1 and L3 agreed with SA5 who pointed out that 'I do have a smartphone but there are tablets at school but only those learners who are doing CAT and IT can access it'. This assertion demonstrates lack of physical and material access of HW and SW resources as the participants need to be at school to access such technologies. In support, Mpungose (2020) posits that lack of physical access to resources such as computers, smartphones inter alia, hampers effective learning, especially in an environment that demands active use of these devices. However, the issue of categorical inequalities, which invokes affordability, intensifies the physical and material access gap between those who are well-off, and those from disadvantaged background (van Deursen & van Dijk 2021). This therefore suggests that HW and SW resources are only accessed by those learners who are from advantaged backgrounds having a good socio-economical background.

In expressing his experiences with material access, SA4 said, 'my parents cannot afford to buy me a smartphone, and I have to rely on school computers'. L2 added, 'I dream of owning a computer or a phone that can be connected to the Internet, but we are poor and I understand that my mother cannot buy me one because we struggle even with food'. These two statements by the participants bring to the fore the issue of affordability, which impedes material access and worsens the first level DD. In the same

vein, Makumane (2021) asserts that first level DD talks to material access of HW and SW resources. This suggests that if learners do not have access to these resources, this level is fast-tracked. Again, Chisango and Marongwe (2021) indicate that having material access translates into having access to the cost of Ed-Tech resources and thus it correlates with an individual's socio-economic status. Thus, from the findings, it is evident that the cost of Ed-Tech resources proved to be an impediment to them owning ED-Tech, and to a larger extent, actively participating in e-learning. More, Mpungose (2021) with Norris (2001) allude that inequalities of physical access are substantiated by demographic differences owing to income, geographic location, gender, age inter alia. This rings true in the current study, as all participants raised the issue of affordability as an entity that limited their access to e-learning.

In addition, L4 brought forth the issue of Internet access: 'sometimes we do not have access to the Internet at school because of poor network, or sometimes the school has not paid for the internet'. L1 issued, 'I sometimes use my father's smartphone when I am at home and I need to do homework, but sometimes I have to move to the hill for better coverage as the network where I live is unstable'. Participants in this instance allude to the aspect of connectivity, which has proven to be a drawback on effective e-learning in sub-Saharan countries including Lesotho and South Africa (Adnan, Kaleliodgu & Gulbahar 2017; Tamrat & Teferra 2020). Thus, in addition, lack of access to Ed-Tech (Internet) also proved to be an issue due to low Internet penetration. This latter assertion is supported by Chisango and Marongwe (2021) who indicate that lack of Internet access inhibits the use of Ed-Tech as demanded by the uncertainty. These findings suggest that connection to stable Internet and access to Ed-Tech resources are necessary to limit DD and curb first level DD.

Theme 3: Skills Access

Skills access in the use of Ed-Tech is of vital importance as physical/material access necessitates that an individual is skilled in effectively using those technologies. In other words, merely having material access is insufficient if they cannot be used to efficiently attain desired outcomes. The issue of skills access became apparent as participants raised issues pertaining to it. This was concisely captured by L1 who was seconded by SA4 and SA6: 'I wish I could

be trained to use a computer in a way that will make me feel comfortable using it for my studies. Some of us struggle while others are used to these technologies as they use them at home as well'. This statement suggests that although the participant understands that it is important to use Ed-Tech, she admits to having lack of skills to use them in a manner that would benefit her. In addition, participants highlight the difference between the 'haves' and the 'have-nots', stating that those who have devices seemingly have an advantage over those who are lacking due to socio-economic issue. Furthermore, the issue of training, or lack thereof, is embedded in the affirmation. In this instance, L1's affirmation underscores the issue of sufficient training that promotes effective use of Ed-Tech. Along similar lines, Mashinini (2020: 172) posits that training provided during the uncertainty was a 'positive but belated critical solution'. This implies that the hasty paradigm shift in the education sector unearthed unpreparedness in terms of Ed-Tech usage (Mpungose & Khoza 2021), especially in secondary schools that were solely reliant on face-to-face settings. This lack of preparation negatively affected the disadvantaged masses, who had to grapple with the new developments and find ways of forging ahead in compromised attempts to feign knowledge building. This situation apparently created a fertile ground for marginalisation of the disadvantaged and perpetuated second level DD, which is seen in requisite skills, or lack thereof, to effectively use Ed-Tech (Biesta 2017; van Deursen & van Dijk 2021).

Furthermore, an affirmation by SA3 accentuates the issue of socialisation in education by Biesta (2017). SA3 said, 'I am used to using social media such as WhatsApp and Facebook, but I am not used to learning serious stuff using the phone'. L4 also indicated that 'there is no learning management system used at school and we cannot access learning material while at home'. This statement implies that the learners are accustomed to socialising with their smartphones to share their experiences with peers, instead of using them as 'formal' learning tools. Further, Khoza and Biyela (2020) assert that learners who are used to social media sites (SMSs) such as WhatsApp and Facebook develop skills that are localised to those particular social platforms, which might overshadow acquisition of prescribed content that promotes professionalisation. In other words, learners tend to be inclined to social skills at the expense of subject needs in the process of knowledge building. Mpungose (2020) and Khoza (2021) aver that socialisation skills

are necessary in influencing effective learning in formal settings. The latter studies further posit that the equal use of social media sites and learning management system can allow learners share their social experiences towards professional knowledge production. This could be achieved through consistent usage of these platforms to harness habit.

Theme 4: Usage

Having motivation, physical and material access, skills access to Ed-tech without any pedagogy that will guide learners, learning can be meaningless (Khoza 2021; Magalhães, Ferreira, Cunha & Rosário 2020). As such, learners need to form a network of nodes/information and be connected in order to share their experiences (Engeström 2001). This is evident when SA3 outlined that 'we normally form WhatsApp groups for communication and sharing of the content …'. Similarly, L1 indicated 'I prefer to learn by doing while assisted by fellow learners or a teacher'. As such, Mishra and Koehler' (2006) suggest that learners need to have a technological, content and pedagogical knowledge for effective learning to occur. In other words, learners need to be well-versed with the type of Ed-Tech at their disposal and to able to use it to learn the subject content.

Furthermore, the use of Ed-tech helps learners personalise learning and empowers them by giving them ownership of how they learn, making education relevant to their digital lives and preparing them for their future (Anderson 2016; Bates 2018). This helps learners to access subject content resources beyond classroom walls in order to be inspired to become problem-solvers, critical thinkers, collaborators, and creators. Consequently, Engeström (2001) advises learners to draw from activity theory when using Ed-Tech which helps them to understand and analyse the relationship between what people think and feel (human mind) and what people do (activity). In other words, learners have to be the ones who initiates the use of Ed-tech during learning activity in order to achieve the outcomes of a particular subject, and this can be successful if the division of labour (activities) are all divided among themselves.

Educational Implications/ Conclusions

The aim of this study was to explore learners' experiences of using Ed-Tech

in the face of DD in order to find practical and theoretical solutions. The findings of this study, which were presented in themes, endorse that the gunpoint use of Ed-Tech during/post the adversity exacerbated digital inequality, especially in schools located in the rural areas having under-resourced schools. That is, most participants displayed unfavourable attitude (denial, resistance and technostress) towards the use of ED-Tech due to the forceful imposition of technology in education. This suggests that motivational access is adversely affected as participants felt compelled to use Ed-Tech, as opposed to them being driven by will, passion and love to use these technologies in the process of knowledge building. Seemingly, lack of motivational access affects physical and material access. This is apparent in the findings of this study, whereby there were categorical inequalities, with learners from advantaged backgrounds having the upper hand over those from disadvantaged backgrounds in terms of material access. In other words, affordability, or in this case lack thereof, proved to be an impediment to material access and active participation in e-learning, and this worsened the first level DD. In addition, access to the Internet was also an issue that ostensibly inhibited effective use of Ed-Tech due to low Internet penetration, high costs and unstable network.

Furthermore, there seemed to be lack of skills access, especially in having to use technology in a formal setting to address subject needs while using socialisation experiences. Put differently, participants had skills to use smartphones for socialisation, but grappled to use the same devices for the acquisition of prescribed content (professionalisation). The required transition between societal need and subject need demanded robust training, which was not an option in most schools due to unpreparedness in adopting Ed-Tech and due to lack of material access. Additionally, categorical inequalities between the 'haves' and the 'have-nots' were evinced in usage, as time spent using Ed-Tech was limited for the have-nots due to restricted material and skills access. Thus, access to subject content was uneven, which resulted in disproportionate access to high-quality education.

Thus, this study recommends promulgation of policies in ICT that will guide effective usage of Ed-Tech, and these policies should cater for uncertainties and novelties that may require unprecedented paradigm shifts. Moreover, these policies should address the issues of categorical inequalities and provide solutions to curb unequal distribution of resources. In this way, the question of unequal access to Ed-Tech would be theoretically addressed,

with proper enactment of the policies issuing practical solutions. In addition, all schools, regardless of their geographical location, should provide free HW resources and access to the Internet, and other SW resources, with the assistance of governments' subventions, for purposes of affordability. In terms of motivational access, learners should be adequately trained to use Ed-Tech from the lower classes in view of acclimatising them to technologies so that they could fully embrace their use. In this way, they would establish personal identities around ED-Tech, thereby appropriating their usage to equilibrate social and subject needs.

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