Neutralising the digital divide: is blended learning a viable solution?

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ABSTRACT

The digital divide (DD), which refers to the gap resulting from unequal access to digital technology hardware, software and ideologically ware resources, arises from disparities in accessing, material and physical resources that enable internet access. In the contemporary world, this divide extends beyond internet access to include the ability to manipulate educational technologies in the knowledge building process. Therefore, the installation of the internet infrastructure in communities should not be considered as the sole facility to access. In attempting to curb the DD, blended learning is seen to be a possible viable option. It is against this backdrop that this article sought to explore the role of blended learning in neutralising DD. This qualitative case study employed the resources and appropriation theory as a lens to analyse DD as a result of societal inequalities and unequal distribution of resources. The community of Inquiry (COI) framework was also used as a theoretical lens to guide the implementation of social and cognitive knowledge-building in a blended learning context. Thereported study employed purposeful sampling involving 26 participants who were the recipients of blended learning in one institution of higher learning (HEI) in Lesotho. Data were generated through reflective journals and one-on-one semi-structured interviews, and guided analysis was used to interpret the generated data. The findings established that blended learning has the capacity to neutralise DD, as it affords students the flexibility to design and engage in individualised learning experiences through both offline and online modes of teaching and learning, thereby meeting their access needs. The recommendation proposed in this article, thus, is for HEIs to adopt blended learning to eliminate categorical inequalities and social divisions in education, ideally promoting equilibrated inclusion of individuals from diverse socio-economic backgrounds in the teaching and learning process.

Article history:
Received 17 August 2023
Received in rev. form 26 Sept. 2023
Accepted 10 October 2023

Keywords:
Access, digital divide, educational technologies, ideological ware resources, blended learning

JEL Classification:
I24

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Introduction

The introduction of technology in education unearthed unequal epistemological access, which seemingly affected the process of knowledge-building adversely, especially marginalised and disadvantaged students (Mpungose, 2020). Technology was introduced in education to align with 21st century skills demand, aiming to promote effective knowledge dissemination in digital spaces, without necessarily attempting to discard face-to-face mode of teaching and learning. However, before all learning institutions worldwide became digitally compliant in different parts of the world, COVID-19 struck. The unprecedented emergence of COVID-19 forced higher education institutions (HEIs) to migrate fully to online teaching and learning platforms, thereby replacing face-to-face mode of teaching and learning (Makumane, 2021; Sokhulu, 2020). This enforced migration was inevitable, as the World Health Organisation (WHO) put in place strict restrictions that barred physical contact in an attempt to curb the rampant spread of the deadly virus (Moralista & Oducado, 2020). Adedoyin and Soykan (2020) attest that the uncertainty initiated digital transformation in HEIs and that, this transformation, under ‘normal’ circumstances, would normally take years of thorough preparation to ensure effective online learning. Adedoyin and Soykan (2020) refer to this hasty adoption of online teaching and learning platforms as ‘emergency remote teaching’ as it was initiated and necessitated by a pandemic. This latter assertion suggests that the hasty adoption of educational technologies (Ed-Techs), which are technologies used to promote materials for educational purposes and knowledge...
dissemination such as learning management systems (LMS) (Moodle, Canvas, Sakai inter alia); social media sites (SMS) (Twitter, Facebook, WhatsApp); and video conferencing technologies (VCT) (Zoom, MS Teams Google Meet and others) (Mpungose, 2020; Mpungose & Khoza, 2021), risked the misuse of those technologies due to lack of preparation by HEIs, lack of requisite skills (digital technology illiteracy), and lack of technological resources (Khoza, 2022).

Thus, the emergence of the COVID-19 pandemic exposed digital gaps in some HEIs around the world. Resultantly, there was pandemonium in HEIs due to dearth of a disaster management plan to handle unfathomable uncertainties (Mataka et al., 2020). The situation was worsened by what appeared to be denialism from different countries regarding the fact that COVID-19 was going to spread wildly. It was only after the unprecedented level of transmission that preventive measures and search for solutions to tame the virus were implemented (Makumane, Khoza & Zuma, 2022). Notably, however, preventive measures and alternative teaching and learning solutions were not sought simultaneously. Physical distancing recommended by the WHO instigated national lockdowns worldwide, wherein movement within and across countries was halted and this resulted in HEIs physically shutting down and disrupting the teaching and learning process, especially those solely reliant on face-to-face mode of teaching. Ultimately, realising that the COVID-19 pandemic was proving difficult to manage and was prolonging disruptions on the teaching and learning processes, alternative modes of teaching and learning were explored by HEIs in an attempt to salvage the academic year (Adedoyin & Soykan, 2020; Sokhulu, 2020). As a result, different Ed-Tech resources were adopted, albeit hastily and with minimal prior preparation by most HEIs, especially in developing sub-Saharan countries where the use of technology is seen as luxurious in most sectors (Ayentimi & Burgess, 2018). Consequently, the use of Ed-Techs exacerbated the already existing digital divide (DD), which is a gap between the ‘haves’ and the ‘have-nots’, including those with limited access and skills in the use of technologies (Roya & Ngcobo, 2023; Van Deursen & Van Dijk, 2019). In other words, the adoption of Ed-Techs aggravated the issue of DD in HEIs owing to the hasty and seemingly inevitable digital transformation enforced by the novelty/uncertainty.

Thus, DD was augmented by unequal material access, skills, and usage and by an unequal distribution of Ed-Tech resources to individuals from different socio-economic backgrounds (Van Dijk, 2012; Mpungose, 2020). This was the case with one HEI in Lesotho, which is under scrutiny in this article. Mashinini (2020) avers that this HEI, as was the case with other HEIs in developing countries, was ill-prepared in handling the uncertainty brought about by the unanticipated pandemic, and that limited Ed-Tech resources hampered effective continuation of the teaching and learning process. Mashinini (2020) adds that notwithstanding the fact that the HEI had, prior to the pandemic, launched the use of a learning management system (LMS) to facilitate blended teaching and learning, this platform was seldom used. In accordance, Makumane (2021) laments that resistance against the use of the LMS in this HEI was heightened by, among others, unequal material access, and Ed-Tech illiteracy of both students, but mostly lecturers, who (the latter) are considered to be digital immigrants/aliens. Idiegbeyan-Ose et al (2018) point out that Ed-Tech illiteracy may hamper access to information that contributes to knowledge-building. Moreover, the unequal material access to Ed-Tech resources by lecturers and students is seemingly perpetuated by socio-economic inequalities, which translates into unequal participation in the process of knowledge-building. This latter assertion implies that socio-economic factors play a pivotal role in either exacerbating or curbing DD, as forceful imposition of Ed-Techs risks inducing techno-stress, which, according to Khoza (2020), is caused by gunpoint use of these technologies by individuals who lack knowledge complexities to effectively use them.

It suffices to claim that the uncertainty instigated a shift in pedagogical practices towards the adaptation of both offline and online teaching and learning approaches in some HEIs. Notably, most HEIs maintained the use of both modes of teaching: that is face-to-face (offline) mode of teaching, and Ed-Tech resources (online) post-COVID-19 pandemic (Colreavy-Donelley et al, 2022). They further suggest that this decision by HEIs to strategically append Ed-Techs within existing and established teaching and learning structures is an attempt to meet students’ access needs, thereby reducing DD. Combining and merging the best of these two modes gives rise to blended learning, which is an eclectic combination of traditional physical student-lecturer face-to-face and online teaching approaches (Niu, Opoku-Manu & Kwarteng, 2021). According to Makumane (2021), blended learning ostensibly offers consequential benefits in ensuring that students have meaningful experiences while catering for their unique learning needs and preferences. In addition, blended learning seemingly minimises forceful imposition of the use of Ed-Tech, which in turn curtails categorical inequalities that perpetuate DD. It is against this background that this article seeks to explore whether blended learning is a viable solution in helping HEIs neutralise DD. The concepts of DD and blended learning are explicated further in the next section.

**Literature Review**

The literature review presents the conceptualisation and the operationalisation of the phenomenon under study, which is digital divide, and also contextualises blended learning, which forms part of the focus of this article. According to Sirmaun and Bohlin (2011) and Mwim and Kritzinger (2016), the term digital divide (DD) first appeared in the mid-1990s. Van Dijk (2012, p. 57) describes DD as the gap between “individuals who have more or less access to computers and the Internet and a different level of digital skills.” This latter affirmation suggests that DD, as a concept, highlights disparities between the ‘haves’ and the ‘have-nots’, especially in terms of technological access, both in terms of resources and skills to effectively use those resources. In this article, DD is seen as a gap informed by access to Ed-Tech hardware, software and ideological-ware resources. According to Norris (2001), DD can be looked at from two fronts: divide between societies, which is broad and looks into global DD (comparison of continents), and within societies, which is considered domestic DD. Norris (2001) further explicates that the use of Ed-Techs exacerbates both global DD and domestic DD, as there is evidently an uneven distribution of these technologies between communities. In the same line of thought,
Mwim and Kritzinger (2016) postulate that this uneven distribution results in access to information and knowledge that is not equilibrated, which in turn perpetuates an unequal impact on economic development and social experiences by individuals with different socio-economic levels. Mpungose (2020) asserts that factors such as socio-economic factors, social class, gender, geographical area and educational background play a role in determining the level of DD. This latter assertion is supported by Makumane (2021), who claims that individuals tend to be socially divided, owing to the use of Ed-Techs, and this was especially evident during the COVID-19 pandemic, whereby gunpoint use of these technologies due to imposed social and physical distancing proved inevitable. This implies that the uncertainty brought forth by the emergence of the novel COVID-19 amplified the already existing inequalities in the use of Ed-Techs, particularly in HEIs. Notably, DD experienced during/post the uncertainty is a result of societal categorical inequalities. In other words, DD aggravates social division and marginalisation in online learning spaces, owing to socio-economic status of individuals as inclusion and exclusion hinges on digital literacy, economic status, geographical location and hardware and software accessibility (Gonzales, 2016).

Thus, the issue of DD brings to the fore the concept of inequality in education. Inequality, according to van Dijk (2012), describes an uneven distribution of resources in which one individual has access to, and enjoys the benefits of more resources than the other in the same vicinity (demographics). Resources in this article are considered to be tools that enhance learning (Khoza, 2022; Makumane, 2018) and are categorised into hardware (HW) (those that can be touched and seen such as computers, laptops, tablets, cellphones, inter alia, that give access to the internet), software (SW) (produced for the hardware in order to facilitate displaying information such as application software packages), and ideological ware (IW) (cognitive processes that manage student actions in effectively using technology) (Khoza, 2022; Mpungose, 2020). Hardware resources, which require users to follow systematic steps to effectively use them, influence the attainment of prescribed subject content, which is taught from the lowest to the highest levels. These resources are underpinned by teaching presence, which promotes systematic and factual knowledge-building (Makumane & Khoza, 2020). In other words, teaching presence, through the use of HW resources, requires the application of the cognitive domain by students in order to facilitate retention of concepts, theories, ideologies and knowledge (Khoza, 2022).

Software resources promote societal-centred activities and permit students to connect, socialise and share information using Ed-Tech resources (Makumane, 2021). SW resources are underpinned by social presence, which according to Garrison (2007), displays specific social skills that allow students to socialise with knowledge. Khoza (2020) posits that socialising with knowledge breeds societal knowledge-building, wherein students’ interaction and engagement is believed to address students’ learning needs, consequently creating conditions for effective attainment of prescribed educational goals. Ideological ware resources present theories and ideas that motivate students to use HW and SW resources efficiently (Makumane, Khoza & Piliso, 2022). This suggests that IW resources are used to manage teaching presence and social presence through effective use of Ed-Tech resources. These resources are thus underpinned by cognitive presence as unique individual experiences in the exploration, construction, resolution and confirmation of understanding of the use of Ed-Tech resources are informed by both professional and societal knowledge-building (Garrison, 2007).

Usage of these three types of Ed-Tech resources (HW, SW and IW) unearth social, economic, political and cultural dynamics, resulting in DD (Hilbert, 2015). This latter assertion suggests that reliance on Ed-Techs in HEIs risks exacerbating DD as there are students from different socio-economic backgrounds with differing levels of financial muscle. Mpungose (2020) laments that students in African universities continue to struggle due to the factors that lead to DD. This was particularly patent at the height of the COVID-19 pandemic, as HEIs that used to operate fully on a face-to-face mode of teaching and learning were forcefully compelled to shift to online teaching. This, as posits Khoza (2021), caused technostress, especially for digital immigrants, who are considered to be technology ‘aliens’ who had to learn how to use technology (Khoza & Biyela, 2020). Several studies conducted during/post the pandemic (Adnan & Anwar 2020; Henaku, 2020; Govender & Mpungose, 2022; Makumane, 2021; Sokhulu, 2020) discovered that technostress brought about by the gunpoint use of Ed-Tech resources somewhat played a role in aggravating DD as users were resistant due to lack of skills, resources and knowledge complexities associated with using Ed-Tech resources.

It is worth noting that, the post-pandemic era seemingly presents a less stressful teaching and learning environment as face-to-face mode of teaching and learning has resumed in some HEIs, including the one under study in this article. However, the use of Ed-Techs to support online teaching has not been entirely neglected (Khoza, 2022; Makumane, Khoza & Zuma, 2022). The use of both modes of teaching gives rise to blended learning. Blended learning, as hinted in its name, refers to an integration of Ed-Tech resources with traditional face-to-face instruction to effectively accomplish prescribed goals (Castle & McGuire, 2010). This suggests that blended learning supposedly presents the best of both worlds. On the one hand, the traditional face-to-face mode of teaching and learning allows for synchronous social interaction among students and between students and lecturers and permits immediate feedback during professional knowledge-building within a designated space (Kim, 2012). On the other hand, Ed-Tech resources promote flexibility in learning, as students are able to access content deposited on digital platforms asynchronously at their convenience (Dhawan, 2020). Supporting these claims, Singh (2003) earlier stated that a single mode of teaching/learning may not necessarily explore the range of choices necessary to provide favourable teaching and learning environment including engagement, social contact, relevance, and context. Singh (2003) further argues that an appropriate blend of the two learning environments, individually and collectively, can contribute to meaningful learning experiences. This suggests that the blended learning approach can cater to the diverse needs and learning preferences of different students.
Liu (2021) conducted a study with the express intent of shedding light on the digital divide in education. A large-scale survey was conducted using rapid survey methodology. The findings of the study demonstrate that notwithstanding that a large digital divide exists among school-age youths in pre-pandemic China, systematic tracking of policy documents illustrated that unequal access to online learning opportunities could be bridged by providing equitable access to learning opportunities, both synchronously and asynchronously, in view of creating a sustainable future. These findings suggest that blended learning is a viable solution in curbing DD, as it provides a platform for reimagining a socially just future for learning in HEIs. Bates (2018) shares a similar view and adds that combining online and face-to-face modes of teaching can enable students to access information and knowledge in ways that align to their individual and unique needs. Thus, contrary to DD, which exacerbates social division, blended learning promotes social inclusion by balancing between teaching presence (HW resources) and social presence (SW resources), thereby promoting individualised cognitive presence (IW resources). These three categories give rise to an equilibrated and fortified educational experience, which in turn reduces social division.

This article relies on the premise that blended learning might be a viable solution in neutralising DD. Rather than placing Ed-Tech resources on a pedestal, blended learning utilises them to enhance learning experiences through a balanced integration with traditional teaching and learning approaches. In other words, blended learning provides students with self-paced learning in an asynchronous platform with face-to-face interaction in a live synchronous platform (Mpungose, 2020). This reduces the pressure to access and use Ed-Tech resources. The resources and appropriation theory by Van Dijk (2005), which addresses issues of inequalities in Ed-Tech resources usage, and community of inquiry (CoI) framework, which guides the implementation of blended learning, were deemed appropriate to frame this article. These two theories are delved into in the proceeding section.

**Theorising DD and blended learning**

This article draws on the resources and appropriation theory, developed by van Dijk (2005), to theorise the relational view of inequalities in the diffusion, acceptance, and adoption of technologies. This theory is adopted in this article because of its ability to analyse DD as a result of societal disparities and unequal distribution of resources (van Dijk, 2012). Additionally, this article is equally framed by community of inquiry (CoI), which addresses the implementation of blended learning, integrating the use of Ed-Tech resources with face-to-face teaching and learning to create participatory and collaborative learning settings (Colreavy-Donnelly et al, 2022). CoI was developed by Garrison, Anderson and Archer (2001) with the express intention of creating meaningful teaching and learning experiences through three elements (teaching presence, social presence and cognitive presence) which promote significant educational experiences. These two theories were considered applicable in this article as they provide framework for both the phenomenon under study (digital divide) and the focus of the article (blended learning).

**Resources and appropriation theory**

Institutions of higher learning are composed of students hailing from different socio-economic backgrounds (Mpungose, 2020). This affirmation suggests that students arrive in institutions already somewhat classified in terms of their financial muscle, or lack thereof. This classification and massification permeates into unequal resource access. Against this backdrop, during/post COVID-19 pandemic, these socioeconomic disparities manifested themselves through DD, resulting in social exclusion (Jansen, 2021). According to van Dyk (2012, p. 60), the resources and appropriation theory states that “categorical inequalities in society produce an unequal distribution of resources causing unequal access to the internet.” In the context of this article, internet access, which is defined as a process of appropriation that is supported by general attitudes towards the internet through physical and material access (van Deursen & van Dyk, 2019), is determined by the availability of data, and proximity to the HEI premises.

The issue of proximity to the HEI, specifically one under scrutiny, was highlighted by Makafane and Chere-Masopha (2021), who posit that during the lockdown period when HEIs were physically closed, some students would be seen alongside the HEI’s fence, in dire desperation to gain access to the HEI’s free Wi-Fi, for continuation of knowledge-building. This latter assertion implies that access to the internet was limited due to closure of institutions and that this exacerbated the DD. Even post-COVID, the issue of internet access prevails as students who stay on campus seem to have unlimited access to internet because Wi-Fi is readily accessible while those who stay off campus seemingly have limited access.

However, despite the free unlimited WiFi access for some, the DD still manifests because of limitations in accessing Ed-Tech resources (Mpungose, 2020; Mashinini, 2020). It appears that the majority of the students rely on their smartphones to access educational material online. Ostensibly, access to online learning, is promoted if one has access to desktop and laptop computers (van Deursen & van Dyk, 2019). Ideally, these gadgets should be connected to peripheral equipment such as printers, scanners, additional scanners, additional screens, hard drives and dock stations (van Deursen & van Dyk, 2019). The availability of the peripheral tools provides additional advantage towards access, which van Dijk (2005) refers to as device opportunity. Device opportunity promotes unequal material, skills and usage access as the ‘haves’ tend to have access to HW resources that are more advanced than the ‘have-nots’ (van Deursen & van Dijk, 2019). Consequently, digital divide is seen through disparities in material access (HW), skills access (SW) and usage access (IW). In other words, access, or lack thereof, to HW resources, seemingly perpetuates DD. Principally, individuals with high disposable income have a greater opportunity to own state of the art devices and peripherals (van Deursen and van Dijk, 2019), while those with low income may have limited or no access to HW resources that can be connected to the internet to promote knowledge-building. This social division translates into unequal access to material resources, broadly seen as access to computers, smartphones, tablets, scanners, printers and others (van Deursen & van Dijk, 2021).
Consequently, equal access to quality education in HEIs is adversely hampered, as advantaged students benefit more than disadvantaged students (Makumane & Mpungose, 2022).

The resources and appropriation theory present five key principles. These principles imply a chain of causality that leads to skewed and distorted participation in professional, social and personal knowledge-building by individuals with different socioeconomic backgrounds (Khoza, 2020). The five principles highlight that categorical inequalities in society produce an unequal distribution of resources, which creates a domino effect that causes uneven access to Ed-Tech resources, leading to unequal participation in society, which in turn reinforces categorical inequalities and unequal distributions of resources (van Deursen & van Dijk, 2021). Table 1 below presents the resources and appropriation principles.

Table 1: Resources and appropriation principles

<table>
<thead>
<tr>
<th>The resources and appropriation theory principles</th>
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<tbody>
<tr>
<td>1. Categorical inequalities in society produce an unequal distribution of resources;</td>
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<tr>
<td>2. An unequal distribution of resources causes unequal access to educational technologies</td>
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<tr>
<td>3. Unequal access to educational technologies also depends on the characteristics of these technologies</td>
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<tr>
<td>4. Unequal access to educational technologies brings about unequal participation in society</td>
</tr>
<tr>
<td>5. Unequal participation in society reinforces categorical inequalities and unequal distributions of resources</td>
</tr>
</tbody>
</table>

Table 1 above demonstrates that the appropriation of Ed-Tech resources is hampered by socio-economic disparities, which in turn adversely hinder active participation and sharing of information for professional, social and personal needs by students, especially those who are economically disadvantaged, thereby exacerbating the DD (Maree & Vos, 2021). Thus, blended learning, which integrates the use of Ed-Tech resources with traditional face-to-face teaching and learning, may be seen as a way to mitigate the divide. The next section will further elaborate on the Community of inquiry framework that underpins blended learning.

Community of Inquiry

The integration of Ed-Tech resources with the traditional face-to-face mode of teaching and learning seemingly enhances cognitive elements that support high order learning, independence and social interaction, therefore creating learning communities (Garrison, Anderson & Archer, 2010). These learning communities augment educational experiences in both offline (face-to-face) and online settings, promoting sustainable lifelong learning. These latter assertions suggest that blended learning fortifies factual teaching, socialisation and the creation of unique individual experiences by students using both Ed-Tech resources and face-to-face teaching and learning approaches. Garrison, Anderson and Archer (2001) propose a framework that unpacks the concept of online/blended learning and identifies three elements that explain the educational experiences from a process perspective. This framework is termed Community of Inquiry (CoI). Akyol and Garrison (2008, p 4) posit that CoI is “formed by the intersection of three main elements: social presence, cognitive presence, and teaching presence.” Implicit in this citation is that the framework is a tripartite entity, implying that profound educational experiences are birthed through the integration of three interdependent presences: teaching, social and cognitive.

According to Ngubane-Mokiwa and Khoza (2021), teaching presence stems from a disciplinary perspective, dealing with prescribed and tailored content that supports structured knowledge. In other words, teaching presence facilitates the acquisition of factual knowledge-building, which supports the retention of theories, concepts, ideologies and facts associated with a particular discipline. Following, teaching presence encompasses professional reasoning, which requires the application of the cognitive skills to ensure a logical progression from design to direct instruction (Akyol & Garrison, 2008; Makumane & Khoza, 2020). Thus, in the context of this article, teaching presence alludes to prescriptive teaching that is typically employed when using content-centred approaches in both offline and online settings. It also extends to include HW resources, which necessitate users to follow systematic steps in their utilisation.

Social presence, as described by Garrison (2007), promotes societal knowledge-building as students benefit from the perspectives of others. Put differently, social presence caters for socialisation with knowledge through student interaction and engagement, facilitated through the use of interactive technologies and teaching approaches (Khoza, 2020). This suggests that social presence is reliant on social skills, societal opinions, shared meaning-making and social reasoning, which are largely influenced by implicit interpretations that are common in a particular society (Bernstein, 1999; Makumane & Khoza, 2020). Therefore, in the context of blended learning, social presence is promoted by student-centred approaches that prioritise the needs of the students at the heart of teaching and learning. It is also facilitated by SW resources, that enable connection, socialisation and the sharing of information, complementing the use of HW resources.
Regarding cognitive presence, Garrison (2007, p. 65) defines it as “the exploration, construction, resolution and confirmation of understanding through collaboration and reflection in a community of inquiry.” This quotation implies that individuals utilise their own unique understanding(s), informed by their personal experiences, to decipher and make sense of relayed knowledge (either factual or social) in order to address their learning needs. Ngubane-Mokiwa and Khoza (2021) attest that cognitive presence is instrumental in helping students construct their own identities based on their individual needs, which are influenced by their subjective educational experiences. Hence, cognitive presence is fostered through individual-centred approaches to learning, which are unique to each individual, shaped by their experiences in both offline and online settings. It is further supported by information and communication technology resources, which facilitate the management of experiences to effectively utilise Ed-Tech resources. Thus, it can be argued that cognitive presence is pivotal and essential in enabling students to navigate both teaching and social presence(s) ultimately promoting meaningful educational experiences that address students’ factual, social and personal learning needs. Figure 1 below presents CoI:

![Community of Inquiry framework](image)

**Figure 1:** Community of Inquiry framework, adapted from Garrison, Anderson and Archer, 2010

**Research and Methodology**

The purpose of this article was to determine the viability of blended learning as a solution in neutralising digital divide within the context of HEIs. The aim was to provide insights that can raise awareness among HEIs, especially those that adopted blended learning during or after the COVID pandemic, regarding how this pedagogical approach can contribute to bridging the digital divide. The article sought to respond to the following questions:

i. How does blended learning neutralise the digital divide in the context of higher education institutions?

ii. What strategies are used by students to effectively utilise blended learning to reduce the impact of the digital divide?

By exploring these questions, the article aimed to shed light on the potential of blended learning as a means to address digital disparities and enhance educational opportunities within HEIs.

**Research Design and Methodology**

This article adopted an interpretive qualitative case study approach to investigate the use of blended learning in a specific higher education institution (HEI) during and after COVID-19 pandemic. Cohen, Manion and Morrison (2011) suggest that this approach is ideal for establishing a deeper understanding of a phenomenon. Given that the objective of this article is to explore whether blended learning can mitigate the digital divide in a specific context, a case study design was deemed appropriate. Purposive sampling, which involves deliberately selecting of entities or individuals with characteristics relevant to research questions (Etikan, Musa & Alkassim, 2016), was effected to select 26 participants. These participants were considered to possess the necessary information to provide authentic data. The selection criteria stipulated that participants must be registered students at the HEI under study and actively using blended learning, wherein the use of both Ed-Techs and face-to-face mode of teaching and learning was their reality. Therefore, second year part-time Masters students were utilised, as they used blended learning for knowledge-building. Prior informed consent was sought from the participants, and assurance of anonymity, and adherence to ethical principles of confidentiality was made. Participants were informed of their voluntary participation and their freedom to withdraw from the study if they felt the need to do so (Creswell & Creswell, 2018). To further ensure anonymity, pseudonyms were used.

**Data generation and analysis methods**

Reflective activities and focus group semi-structured interviews were used as data collection methods in this study. These methods were applicable to the reported study since they allowed for flexibility of versatile questions that accommodated the different individuals, while still aligning with the main research questions. The interviews, which lasted approximately 30 minutes, were
audio-recorded for purposes of easy transcription and accuracy of conveyed information. A guided analysis method was used to analyse the generated data. This type of analysis, according to Samuel (2009), allows the researcher to determine themes prior to the generation of data, as guided by theories that underpin this article.

Findings and Discussions

The findings are organised and presented according to thematic analysis guided by the theories underpinning the study. Additionally, themes that emerged through the analysis of collected data are also included. To enhance credibility of the findings, direct quotations from participants are used to provide first-hand evidence and support the presented data (Creswell & Creswell, 2018).

Theme 1: Experiences with online learning

The participants relayed their experiences of using online learning. L3 stated “Online learning is convenient when someone has problems of attending physical classes. However, it is costly for self-sponsored students sometimes as I attend classes because my device (cellphone) does not install applications from the internet.” This statement, similar to the viewpoints expressed by L1, L6, L8, L9 and L14, highlights two issues. The first issue pertains to the convenience offered by online classes, especially post-graduate students who may be unable to physically attend in-person classes. Online classes provide the flexibility for students to participate from any location as long as they have internet access. However, the second issue revolves around the challenge of internet access. This presents a barrier to accessing online learning, especially due to the high cost involved, especially for students who are not sponsored. This aligns with the perspective put forth by Mbambo-Thata (2020), who avers that “data cost is a major digital divide that inhibits access to learning in digital spaces” (p.10). This assertion suggests that the expensive nature of data acts as a hindrance to equitable educational access, thereby exacerbating the DD.

L11 said this in his reflective activity regarding his experience with online learning, “not so very good. Lecturers (most of them) would send notes and not bother to discuss them with students. And if they tried, there would be less participation.” This sentiment was also reflected by L12, who wrote, “it was not good since lecturers just sent students material online without giving any explanation or clarification.” This was also echoed by L15 when she said, “I struggled a lot with online learning as there was not enough guidance during learning. The lecturers gave a lot of material, which I hardly read. And there was a lot of plagiarising.”

The assertions made by these participants shed light on the issue of knowledge building through online platforms. Based on their assertions, it seems that the lecturers can be classified as digital immigrants, as they lacked familiarity and proficiency in using EdTech resources due to limited skills and knowledge complexities required for effective utilisation. Consequently, these lecturers who uploaded materials on the online platform without actively facilitating student engagement and but who could not help the students’ socialisation with the knowledge to address their societal needs. In other words, while they were promoting professional knowledge building, which addresses the descriptive question of ‘what’ (teaching presence), while neglecting the facilitation of societal knowledge building, which addresses the operational question ‘how’ (social presence), and encourages student interaction and engagement (Khoza, 2020). This suggests that students’ experiences with online learning were hindered by the exorbitant cost of data, and lack of technological skills, both on the part of lecturers and students, impeding the effectiveness of the knowledge acquisition process.

Theme 2: Accessibility of internet and data during online learning

Regarding accessibility of internet and data, during online teaching and learning, participants in the interviews stated, “It is not accessible, it is impossible to download material from the internet. The spots are in open space when it rains it is impossible” said L26. L6 put forth “internet accessibility is difficult to access as not all students can afford data bundles and the university’s Wi-Fi is ineffective at times.” The participants’ affirmations allude to the challenges of accessibility experienced during online learning. It is evident that participants encountered difficulties with internet access which significantly impacted their ability to engage in the knowledge building process. As mentioned by participant L26, limited internet access made it difficult to download materials from the internet. Adnan and Anwar (2020) aver that most students do not have access to reliable internet access, which hinders their online learning experience. In the specific context of this higher education institution (HEI) the lack of access to the internet may be attributed to a hasty transition from traditional face-to-face learning to online learning prompted by the unprecedented emergence of the COVID-19 pandemic. Adnan and Anwar (2020) emphasise that such rapid transitions have exposed the resource limitations within HEIs, revealing the ill-preparedness of HEI to address the issue of access and internet availability. Mashinini (2020) further adds that poorly resourced HEIs experienced challenges such as access to the internet and thus affected students’ capacity to effectively participate in online learning. This denotes that participants had to use their IW resources (cognitive presence) to manage experiences in order to use Ed-Tech resources effectively. The participants expressed that essential resources for facilitating effective and efficient online learning include reliable access to Wi-Fi, smartphone, laptops and functional computer laboratories. Access to these resources would greatly contribute to promoting beneficial educational experiences that cater to students’ factual (teaching presence), social (social presence) and personal (cognitive presence) learning needs.

Theme 3: Experiences with blended learning during and post COVID-19

The participants relayed their experiences with blended learning, in their reflective activities, with L7 giving an intriguing comment, “physical classes were correcting the faults of online learning and online learning was increasing the learning pace of the students.”
L10 insisted, “It helped so that the lecturer was able to explain in thorough detail the notes and material that they had sent on the online platform.” Similarly, L13 wrote, “it helped because the notes/material uploaded were clarified when we attended physical classes.” On the same line of thought, L15 said, “we were able to meet the lecturers a few times a week and that helped to clarify the things that we read on our own but could not understand.” It is noteworthy that the majority of participants held a similar view regarding blended learning. They expressed the notion that the two modes of teaching were seemingly complementing each other. Participants believed that what may have been unclear in the online class, or lacking in the online, was clarified in a physical face-to-face class with the lecturer. What is evidently glaring in the direct quotations above, especially in L7’s statement, is that online classes were seemingly marred with inefficiencies that needed to be complemented through physical classes, where students had direct access to the lecturer. This observation aligns with the assertion made by Castle and McGuire’s (2010) that blended learning contributes towards effective accomplishment of prescribed goals. In essence, any shortcomings, or inefficiencies in one mode is complemented by the strengths of the other mode, providing an array of choices to contribute to meaningful learning experiences (Singh, 2003). Blended learning also introduces students to different learning contexts, as seen in L16’s statement, “it improved our knowledge of technology and exposed us to different ways of learning.” This assertion implies that integrating Ed-Tech resources with traditional face-to-face instruction enables students to access information and knowledge in a manner that address their individual needs and enhances their technological skills and usage (Bates, 2018). It suggests that apart from fulfilling the requirements of the subject (teaching presence) and societal engagement (social presence), blended learning also addresses students’ personal needs (cognitive presence). This alignment with students’ personal needs corresponds to Biesta’s (2015) concept of good education, which is an equilibrated use of teaching, social and cognitive presence.

Theme 4: Strategies to curb digital divide

Digital divide, which L3, in the interviews described as “unequal access to information and technology” with L8 adding, “access to resources which are necessary for online learning; cellphones and internet” emerged as a recurring theme. They shared their experiences with DD, with L6 saying, “At times, I had no money to buy data bundles, and that says I missed a lot of online classes.” L14 posited, “a cellphone is not a problem, there has always been the absence of data and means to buy it. That on its own contributed to the inability to access the internet.” L19 asserted, “library internet café closes at 1600hrs, not providing enough access for us to the usage of desktops because we are many.” The aforementioned assertions reveal the challenges of both hardware and software inaccessibility, which hampered the participants’ active participation in online learning among participants. Software access was impeded by a lack of financial means to acquire data bundles preventing them from accessing the internet and sharing information and experiences virtually. Makumane and Mpungose (2022) argue that marginalisation in online learning is inflamed by socio-economic factors, with an individual’s financial muscle, or lack thereof, at the helm of the problem. Van Dijk (2005) suggests that marginalisation stems from categorical inequalities in society, which then results in unequal distribution of resources. This is also evident in the limited access to HW resources mentioned by participantL19 where the number of students exceeded the available Van Deursen and van Dijk (2021) assert that lack of material access and internet usage contribute to first level of digital divide, resulting in inequalities in the process of knowledge building as the ‘have nots’ are marginalised during the online teaching and learning process.

During the interviews, the participants put forth ways in which they reckoned DD could be curbed, in order to strive for equal access to Ed-Tech resources to enhance learning experiences. L5 said, “I encourage the management to have more computer laboratories with access to the internet for students to use with social distance maintained. And blended learning with alternating groups of learners.” L6 added, “computer laboratories should be fully functional for those students who do not have e-learning devices. Lecturers should not only post reading materials on the [LMS] but attend students’ question in the chatroom as well.” L14 suggested, “they should not rely on technology only, instead we could be given handout for us to read and be taught physically as well as some of us find challenges when accessing the internet. We could also be given take home tests that we may submit physically.” L22 lamented, “lecturers should have an understanding that the students are of different backgrounds and do not possess the same knowledge about digital devices and some, because of their locations, do not have access to the internet.”

The assertions put forth by the participants seemingly ape the somewhat disproportionate access to online HW (teaching presence) and SW (social presence) resources in online learning. The participants’ suggestions advocate for better material access in the form of devices (desktops in laboratories) and internet, that should be facilitated by the HEI in question. Mashinini (2020) posits that HEIs should ensure that all students from different backgrounds are granted equal access to Ed-Tech resources and to connectivity to promote effective knowledge building process. Makumane and Mpungose (2022) assert that DD is exacerbated by lack of internet access and Ed-Tech HW resources, which hinders the sharing of information for teaching, social and cognitive presence. Therefore, the recommendations put forth by the participants in view of curbing the DD seem to address the issues of both lack of HW resources (by recommending that there be more computer laboratories) and SW resources (by recommending access to the internet). It is worth noting that, the quoted affirmations by the participants also allude to the use of blended learning as a means to curb DD. This suggests that, in addition to online teaching and learning, participants also advocate for a combination of face-to-face modes of teaching and learning in order to leverage the best of both worlds, that is online and face-to-face.
Theme 5: Preferred mode of teaching (face-to-face vs online)

In their reflective activities, out of 26 participants, 20 participants (L1, L2, L3, L4, L7, L8, L10, L11, L13, L14, L15, L16, L17, L18, L19, L20, L23, L24, L25, and L26) highlighted that they preferred face-to-face mode of teaching and learning to online learning. For instance, L10 said, “I prefer face-to-face because there are much lesser expenses involved in the face-to-face classroom.” L15 stated, “I prefer face-to-face as the lecturers are able to come to our rescue where more clarification is needed,” with L19 adding, “because it is simpler. We are able to ask questions and get clarifications without any disturbance nor network problems.” These statements denote that participants were more comfortable with face-to-face mode of teaching and learning, citing reasons such as affordability and simplicity. Participants found face to face instruction more accessible and straightforward, as any complexities or confusion could be addressed by the lecturer in real time.

Three (3) participants (L9, L12 and L22) said that they preferred online learning. L22 said, “I prefer online learning because it is done at one’s comfort zone without the need to physically interact with others and time of study is not an issue.” L9 asserted, “online because I get to go straight to the lecture of the day and listen all over again if I have forgotten what was taught.” L12 posited, “I prefer online because it gives students a chance to explore new things like Google meet, Thuto, and it gives struggling students to have an opportunity to look after their poor families.” These latter assertions by these participants illustrate the convenience associated with online teaching and learning. In other words, these participants reckon the use of online learning as ideal in that it allows individuals to participate and contribute to the process of knowledge building at their convenience. Dhiwan (2020) supports this view, and claims that online learning promotes flexibility in teaching and learning, as students can access prescribed content asynchronously at their preferred convenience and time. Dhull and Sakishi (2017) also emphasise the personalised nature of online learning enabling students to tailor their learning experience according to their preferred learning style, content and skills.

Three (3) participants (L5, L6 and L21) claimed that they preferred blended learning. L5 said, “I prefer both because online is convenient in cases of COVID-19”. L6 indicated, “I prefer both. In other words, face-to-face on normal circumstances and online during COVID-19 or disaster-like situations.” These affirmations imply that participants view online learning as a panacea for uncertainties. Put differently, online learning is seen as a remedy that can be used in the continuation of knowledge building process should there be an unprecedented pandemic such as the novel COVID-19 pandemic. Mpungose (2020) posits that the emergence of COVID-19 compelled most HEIs to migrate to e-learning, and this helped salvage the academic year. Sokhulu (2020) adds that the adoption of Ed-Tech resources at the advent of the pandemic was crucial in ensuring continuity of the knowledge building process. Thus, the blend of both online and face-to-face modes of teaching and learning, even in the absence of a pandemic, promises ample benefits, including effective attainment of prescribed goals, as it caters for both professional knowledge building (teaching presence) and societal knowledge building (social presence), which in turn breeds personal knowledge building (cognitive presence), thus addressing students’ unique learning needs and preferences (Khoza, 2020; Makumane, 2021).

Conclusions

The emergence of COVID-19 glaringly emphasised the necessity of adopting online platforms, especially in HEIs that were solely reliant on face-to-face mode of teaching and learning. However, this abrupt imposition of Ed-Tech resources highlighted unequal epistemological access to HW, SW and IW resources to promote quality education. Remarkably, the post-COVID-19 era saw HEIs continuing to integrate Ed-Tech resources, leading to the rise to blended learning. The purpose of this article was to explore the role of blended learning in neutralising DD. The findings of this article demonstrate that blended learning has the capacity to neutralise DD as it affords students the flexibility to design and embrace individualised learning through their unique experiences with both synchronous and asynchronous modes of teaching and learning in order to meet their access needs.

In other words, the decision by HEIs to strategically append Ed-Tech resources with existing and established teaching and learning structures proves to meet, to a certain extent, students’ access needs, thereby reducing DD. This implies that blended learning minimises the forceful imposition of the use of Ed-Tech resources, which seemingly curtails categorical inequalities that exacerbate DD. Consequently, systematic and factual knowledge building (teaching presence); social skills that permit students to socialise with knowledge (social presence); and unique and personal theories and ideas that manage teaching and social presence (cognitive presence) are encouraged and put at the helm of the knowledge building process in an attempt to offset unequal distribution of resources and unequal participation in society. The balanced use of these three presences contributes to the effective accomplishment of prescribed goals, as categorical inequalities are diminished owing to the social inclusion factor that is inherent in blended learning. It is noteworthy that gradually, DD has become a social problem rather than a merely technological one (Ragnedda, 2019). Thus, the recommendation put forth in this article is that HEIs adopt blended learning in view of discarding categorical inequalities and social division in education, thereby promoting equilibrated inclusion of individuals with different socio-economic backgrounds in the teaching and learning process. However, one glaring limitation in implementing blended learning in view of addressing DD is dearth of policies that would ideally guide proper implementation. Such a limitation may be curbed by ensuring promulgation of a policy that talks to the issue of blended learning, specifically providing a practical implementation framework that would take into consideration socio-economic factors and categorical inequalities brought about by the adoption of online teaching and learning and providing viable solutions that would meet the needs of both lecturers and students.
Acknowledgments

The authors would like to heartily thank the participants for partaking in this study.

All authors have read and agreed to the published version of the manuscript.

Author Contributions: Conceptualization, M.A.M.; methodology, S.W.; validation, T.M.W.; formal analysis, M.A.M.; investigation, T.M. W.; resources, S.W. & S.N.; writing—original draft preparation, M.A.M.; writing—review and editing, T.M.W. & S.N. (language editor).

Funding: There was no funding for this research.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The data presented in this study are available on request from the corresponding author. The data are not publicly available due to restrictions.

Conflicts of Interest: The authors declare no conflict of interest.

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