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Perceptions of First-Year Students from Disadvantaged Backgrounds on E-Learning at a South African University of Technology

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Abstract

The introduction of innovative e-learning and teaching methods at universities of technologies necessitates the examining of students' perceptions of these methods in the promotion of student success. In South Africa, the majority of first-year students are not exposed to technology-aided learning methodology during their high school career, especially those from disadvantaged demographics. The purpose of the study is to examine student perceptions regarding their experience of e-learning at a South African university of technology with specific reference to the success of first-year students from disadvantaged backgrounds. Using qualitative research methods through semi-structured interviews, the researchers discovered that first-year students from disadvantaged backgrounds are experiencing challenges in terms of access to resources such as computers, laptops and reliable internet connection. Furthermore, inadequate training on the use of online resources and unsatisfactory performance during online assessment were discovered and these are heightened by the Covid-19 pandemic. First-year students from disadvantaged backgrounds are exposed to a variety of barriers that have an adverse impact on their success. The study recommends that higher education institutes provide the necessary resources to facilitate seamless assimilation of first-year students into the new environment.

Keywords: first years, disadvantaged backgrounds, perceptions, e-learning, Covid-19, university of technology

Introduction

The fast-developing world of innovative technologies compels higher education institutes (HEIs) to improve their teaching and learning strategies. This need has been further exacerbated by the Covid-19 pandemic which inadvertently forced all universities worldwide to engage in e-learning. Digital technologies are now an integral aspect of the university student experience used to enhance students' learning. Research on e-learning and teaching has gained impetus in the past 10 years (see Bates 2019;

Owston, Yor, and Murtha 2013). The use of technology-aided learning and teaching approaches in conjunction with face-to-face approaches introduce first-year students to a new and unfamiliar territory that could be thrillingly exploratory to some, but can also act as a cultural shock to others.

The latter experience is contrary to popular assumptions that today's youth, coined "digital natives" by Marc Prensky (2001), are all computer savvy and are all in a position to manipulate and learn through the use of the latest technological instruments. The aim of this paper is to examine students' perception of e-learning approaches in promoting academic success among the first-year students from disadvantaged backgrounds at a chosen university of technology which is the Durban University of Technology (DUT) in South Africa. Facilitating the adaptation to this exciting environment depends on different variables and, in the long term, has a direct bearing on students' success and output. This will help the researchers to understand student experiences of these e-learning methods.

The modern world of scientific and technological progress embodied in the digital economy demands that the education system be in constant evolution in accordance with the needs of society, thereby searching for the most progressive teaching modes (Meskhi, Ponomareva, and Ugnich 2019).

The review of the literature will provide a broader understanding of the other studies done on e-learning.

Literature Review

Alenezi (2020) describes e-learning as a learning procedure whose creation is through interactions with the digital delivery of content, services based on the network, and support provided by lecturers and other support structures. E-learning methods encompass the supplementing of face-to-face learning methods with online lecture material to learning being done entirely online via the learning management system (LMS) (Guri-Rosenblit 2005; Shemla and Nachmias 2006). The latter has been the most prevalent today owing to the Covid-19 pandemic.

In order for universities to successfully deliver e-learning, a well-developed setup in terms of infrastructure is warranted, where students are capacitated and upskilled in terms of the use of online tools. Capacity development in the use e-learning tools for educators is also essential for the transformation and adaptation of their instructional and assessment approaches, in order to keep up with students' needs and to advance their educational opportunities (Evans and Robertson 2020).

Prensky (2001) coined the term "digital natives", referring to children born in the environment dominated by the use of techno-gadgets such as video games, cell phones, video cameras and a variety of modern techno-tools. He based his assumptions on this

generation of children, adolescents and now adults being born in the era where they were exposed to digital technology, which gave them the ability to manipulate technological gadgets from an early age. New terms later emerged such as "Net Generation" or "Net Geners" (Tapscott 2009), and Jean Twenge called them "iGen" (Evans and Robertson 2020, 275).

Kirschner and De Bruyckere (2017) argue that teachers' lack of digital knowledge and proper training in technology-mediated teaching and learning impedes digital natives from successfully learning using this platform. The digital natives or iGen who are now adults and possibly teachers, if properly trained, would be in good standing to pass on the technological pedagogical knowledge to the new generation of students. This means that while realising the importance of digital literacy, each generation of teachers needs to be trained and prepared to transmit improved technological skills and knowledge to the next generation of students (Evans and Robertson 2020).

Research findings have purported that student's experiences and learning styles do affect their level of incorporation of e-learning materials into their learning practices (Kivunja 2014). Student's personal circumstances, their level of motivation or attitude towards learning, computer literacy, and approach to learning have a direct impact on the successful infusion of e-learning platforms (Alenezi 2020). In corroborating this position, Kosloski and Carver (2017) cite studies conducted by the Bill and Melinda Gates Foundation (2012) suggesting that not only do student perceptions of instruction predict student achievement, but they are also more predictive of achievement gains than standardised testing measures or classroom observations. As a result, probing student perceptions of the learning environment and instruction may help lecturers to determine the way in which to improve practices and ultimately improve student learning in the use of e-learning platforms as methods of instruction (Bill and Melinda Gates Foundation as cited in Kosloski and Carver 2017; Seymour-Walsh et al. 2020).

The increased integration of content management systems as a teaching method in the face-to-face classroom, such as Blackboard, Moodle, slides and video recordings (Kirschner and De Bruyckere 2017; Lust et al. 2011), is meant to enhance the quality of teaching and learning, and the comprehension of new content matter and higher-order learning. There is an expectation that since twenty-first century students have been introduced to the use of technology from an early age, they would seamlessly adjust to the technology-aided learning strategies at university level. According to Henderson, Selwyn and Aston (2017), learning in visual form by means of digital technologies has the potential to enhance student learning and improve the memory of learned experiences. Amidst the said benefits of technology aided teaching and learning, the phenomenon explored in this paper is the state of readiness and adaptation of first-year students from disadvantaged backgrounds when introduced to this teaching and learning and assessment approach and its efficacy.

Owing to the Covid-19 pandemic, most universities expedited the use of e-learning as a form of learning to mitigate the situation.

Transformation of South African Universities

Post-1994 and the attainment of democracy, new legislation has made it possible for many South African students from disadvantaged background to access HEIs. According to the report of South African Market Insights (2020), approximately 7.4 per cent of youths aged 20 to 24 years came from the lowest household income quintile in comparison to 47 per cent with Bachelor qualifications who came from high-income family backgrounds. Many HEIs are experiencing a rapid increase in registrations of the first generation of students from disadvantaged backgrounds. Among the many challenges accompanying this trend is that many of these students come from low-income families and unfortunately many of them are not completing their qualifications in the minimum graduation time (South African Market Insights 2020).

The transformation of HEIs and creating access for disadvantaged students over the years have triggered a debate over the quality and readiness of students entering HEIs. Stereotypical attitudes have been created that the entrance requirements have been lowered, which have resulted in more students from disadvantaged backgrounds entering HEIs. This perception is strengthened by the low numbers of students graduating in minimum time and the relatively fewer pursuing postgraduate studies (Cornell and Kessi 2017; Petersen, Louw, and Dumont 2009).

This phenomenon was also fuelled by the Department of Higher Education and Training's (DHET) funding policy whereby universities were in the past funded based on throughput rates. In recent years, the DHET policy (2020) changed the funding to the number of students accepted leading to the high entrance numbers. However, this was not followed by the same commitments from universities to see students through. Cornell and Kessi (2017) state that the stereotypical discourses on the lowering of academic standards by students from disadvantaged backgrounds in institutions previously reserved for students from affluent backgrounds, place the blame on transformation rather than on the HEIs. These kinds of discourse create an impression that the environment at HEIs readily accommodates students from various educational, social and economic backgrounds being assimilated and seamlessly succeeding.

Statistics indicate that students from low-income economic backgrounds have high rates of early school leaving and poor transition rates to tertiary education and employment (South African Market Insights 2020; Tentsho, McNeil, and Tongkumchum 2019). It has been found that students' ultimate success at HEIs depends immensely on the experiences they have during their first year. Although students arrive at universities motivated and with high aims of succeeding, one needs to acknowledge that the transition from a high school setup to a university environment is mainly accompanied by great anxiety and fear of failure (Al-Sheeb, Abdulwahed, and Hamouda 2018). Despite the supporting programmes introduced to provide first-year students with

assistance in developing essential skills and learning strategies, institutions are still experiencing unacceptably high rates of dropout of students at this early stage of their university learning careers (Al-Sheeb, Abdulwahed, and Hamouda 2018). Other contributing factors include the lack of accommodation, transport and hunger.

The DUT, like many other universities of technology, have put in place measures that would enable first-year students to be introduced to the technologically advanced methods of teaching and learning.

Platforms such as Moodle and Microsoft Teams are used to enhance the quality of teaching and learning and to make it more possible for students to access learning content. The Faculty of Management Sciences' 11 departments have an average annual intake of 3 700 first-year students. The majority of the departments are based at the DUT's ML Sultan campus, while others are based at the Pietermaritzburg Riverside campus. This study focuses on students based at the ML Sultan campus in Durban.

This paper seeks to explore the experiences of first-year students from disadvantaged backgrounds, when encountering for the first time the technology-aided teaching, learning and assessment methods at universities of technology.

Students from disadvantaged backgrounds put great effort into succeeding despite the various barriers that many of them encounter such as access to resources during their academic journey. It is thus incumbent on HEIs to ensure that teaching, learning and assessment take place in an environment that is conducive to learning. The teaching and learning environment has to be adapted based on the educational and technological backgrounds and basic needs of students.

The Constructivist philosophy supports the view that students are central to their own learning and that their perception of their learning environment is an imperative element in the way in which they form an understanding of their role in the class, their self-conception and self-reflection, and also the way in which they interact with the lecturers, other students and course content (Kivunja 2014; Seymour-Walsh et al. 2020; Stefl-Mabry, Radlick, and Doane 2010). First-year students create their own comprehension and information of the new environment around them. According to Alenezi (2020), when students are confronted with new concepts, they try to reconcile these with their prior knowledge and experiences, aiming to create a new reality.

The changing reality of first-year university students' demographics means that they present diverse demands as a result of personal and social factors that warrant swift interventions facilitating seamless integration and access to available facilities. The gap between prior experiences and new knowledge has the potential to lead to withdrawal or feelings of alienation or disengagement on the side of first-year students. Alienation is explained by Mann (2001) as the situation of an individual being separated or isolated from group activities which that individual should be part of. Alienated students may

isolate themselves from others and develop resistance to involvement with course materials and learning activities that include the use of online activities (Johnson 2005; Morinaj et al. 2017). According to Coates (2010), student engagement should include the following characteristics: active and cooperative learning; involvement in challenging academic tasks; constructive relationships with academic staff; and a feeling of belonging, encouraged through the institution's learning environment or community. Disengagement therefore has the potential of the student losing interest in academic activities. Consequently, poor performance may result in extreme circumstances, the student may contemplate dropping out of university.

Research Methodology

This is a qualitative study. As Mohajan (2018) states, the qualitative research method is used to gain an in-depth understanding of the particular problem. This includes capturing people's observations, feelings, opinions, practices and experiences in the particular atmosphere and context in which they act and answer (Creswell 2014). Qualitative research does not aim to reach conclusions that can be generalised based on a representative sample, but the aim is to gain insights into a studied phenomenon and grasp the variety within the studied structure (Roblek et al. 2019). Furthermore, in a qualitative study, the depth of the collected data is essentially more important than the numbers (Burmeister and Aitken 2012; Margaryan, Littlejohn, and Vojt 2011). As the purpose of the study is to understand student perceptions of blended learning as an e-learning method at the DUT, the qualitative research approach is most suited.

The purposive sampling approach was employed to collect data. This method was used for its suitability as it enables the researchers to select the best-suited respondents owing to the impact that they would have on the results of the study (Etikan, Musa, and Alkassim 2016; Mehmetoglu 2004). To enable the researchers to answer the research question, first-year students from disadvantaged backgrounds who are registered for various programmes in the DUT's Faculty of Management Sciences at the ML Sultan campus were interviewed. The reason for targeting respondents from lowest quintile high schools was to assess the students' preparedness and their readiness for the use of e-learning as such schools are purportedly not well equipped in terms of technological facilities. Andoh-Arthur (2019) refers to gatekeepers as people who provide researchers with access to the research population. For the current research, the Institutional Research Committee (IREC) served as the gatekeeper.

Although the sample size is important in any study, there are no rules for size in a qualitative inquiry as the size is dependent on the research aim, contribution and resources available (Mohajan 2018). The data were collected with a structured interview conducted by the researchers. Before each interview, informed consent was sought and an interview session lasted between 20 and 30 minutes. Data saturation was reached at the twenty-fourth participant. Data saturation is the point during data collection where no new themes are emerging (Braun and Clarke 2021). The data were recorded and

transcribed. To redress reliability issues, Creswell and Poth's (2016) intercoder agreement method was used. In doing this, both researchers independently coded and analysed the data and then compared the results to establish how reliable the data analysis process was. Upon completion, both researchers' analysis was similar in confirming the reliability of the research process. Content analysis was used to analyse the data using the NVivo statistical software. Erlingsson and Brysiewicz (2017) refer to content analysis as a method of transforming a large amount of text into extremely organised and comprehensible summaries.

Ethical Clearance

Before the survey, approval from the DUT was obtained and the survey was administered in accordance with the requirements as approved by the IREC.

Findings

The researchers interviewed 24 respondents, and after coding and analysis, the following three themes emerged:

- students' ownership and competency in using learning tools;

- students' perceptions based on their experiences of e-learning; and

- e-learning competency and academic performance.

Theme 1: Students' Ownership and Competency in Using Learning Tools

The interview discussions revealed that all students own a mobile phone but only 75 per cent have smartphones, whereas only less than a quarter have laptops, and none of the respondents have personal ownership of desktops. Mobile phones were predominantly used for informal learning and communication until the Covid-19 pandemic struck and it became the main learning tool. Based on the profile of students interviewed, although 75 per cent had smartphones, they all found it difficult to participate in online studies owing to network issues and the lack of mobile data. The 25 per cent who do not have smartphones nor laptops were only able to participate in online learning with on-campus computers, hence did not engage in any form of online learning during the pandemic. The quotes below reflect the participants' perceptions. Pseudonyms are used to protect the identity of the participants.

> Mobile phones are less expensive than laptops and are easier to carry around. (Sello, 17-year-old male)

> I think we all have mobile phones but some do not have smartphones nor laptops, so online learning is impossible especially during lockdown. (Vuyo, 16-year-old male)

> I own a laptop, but online learning is only possible on campus or at the student residents. At home, there's no network. (Sandra, 18-year-old female)

> [T]ruth need to be said, normally most students use their mobile phones for socialising and seldom for formal learning. When their interaction is link to learning in anyway, it is more about enquiring from friends about assignment submission dates or test dates. Very little is about content related to their studies or in exceptional situations, when they are forced to work on group assignments. (Nomaliso, 17-year-old female)

Regarding the level of competency in the use of tools of technology, the following was discovered: half (12 out of 24) of the respondents rated themselves as very good and good in terms of their overall competency in relation to the use of technology for learning. This includes accessing learning materials by means of Google Scholar, lecture notes using LMS platforms, and interacting with their lecturers and fellow students. The other half were not satisfied with their competency in terms of the use of technology for learning. A participant stated:

> [W]e understand that we have to learn and adapt to the new ways of learning by means of online learning. However, there will always be a gap between those who were exposed to the technology and the novices. We are not stupid, but we simply lack the skills. With more training and exposure, there are possibilities that most of us shall overcome these shortcomings as long as we are afforded opportunities to learn. (Mildred, 18-year-old female)

The first theme shows that, although e-learning has become part and parcel of the world we live in, most students either lack the technological gadgets or lack the skills to participate in it. This situation has also been amplified by the Covid-19 pandemic. This situation mirrors what is happening in other African countries as the study by Ntshwarang, Malinga and Losike-Sedimo (2021) in Botswana discovered that the use e-learning in universities is constrained by the lack of proper tools, infrastructure and internet access off-campus.

Theme 2: Students' Perceptions based on their Experiences of E-Learning

The interview discussions revealed that although the majority of the respondents understand what e-learning is about, they indicated that the majority of students did not have access to computers while at high school. They therefore entered HEIs with minimum or no computer literacy. This situation resulted in the majority of the respondents experiencing challenges in accessing or retrieving learning resources from online platforms. The respondents indicated that the training for most first-year students on online learning is inadequate to enable them to engage with their fellow students using platforms such as Blackboard or Moodle. Owing to inadequate training and an insufficient number of computers, the respondents felt that the institution was not yet ready to fully implement e-learning for teaching and learning purposes. The unpreparedness was therefore made prominent by the Covid-19 pandemic as most students found it difficult to adjust to online learning with little transition time. Three participants said:

[T]he closest one has come the use of the computer is through the use of smart mobile phones. In fact, I did not know that a mobile phone can be seen as a form of 'computer', being a digital instrument. If we were made aware of that, one could have seen it as a more useful instrument, more than just for sending messages and playing games. (Njabulo, 19-year-old male)

[L]ack of computer literacy from high school days impacted negatively in the process of being readily assimilated in the culture of eLearning environment (teaching and learning). Most of us students struggled to get used to the use of computers and it was even more difficult when we were introduced to platforms such as Blackboard and Moodle. You need to understand that one is in her first year; handling a computer for the first time in one's life; then having to access lectures slide online – how confusing can that be? We did receive some training. However, it was not adequate for a first time user. It was more frustrating, more especially when one noticed that some of the students were more comfortable because they were exposed to computers before. (Mary, 17-year-old female)

[A]ll along I was not comfortable with elearning, then COVID-19 happened and made it worse. Imagine being taught and assessed through a medium that you are not conversant with.)Derrick, 17-year-old male)

As discovered by Olum et al. (2020) in Uganda, training of students and staff members is the key to improving the will and to fostering positive attitude towards e-learning. In the current study, the second theme brought to the fore the unpreparedness of the students for e-learning. Their responses suggest that their high school backgrounds put them at a disadvantage and worse of all, they receive inadequate training to become conversant with e-learning systems.

Theme 3: E-Learning Competency and Academic Performance

Half of the respondents (12 out of 24) indicated that the lack of or inferior skill in using online platforms has a direct impact on their academic performance. Their fear of taking online tests has the potential to lead to feelings of alienation, demotivation and possible failure. Similarly, Edelhauser and Lupu-Dima (2020), in their study of Romanian universities discovered that student and lecturer conversance with online testing is crucial to the success of e-learning.

In the current study, a number of factors have the potential to contribute to students' feeling of vulnerability when they are expected to sit for online assessments. This includes inadequate training and access to laptops and Wi-Fi, more especially after normal working hours. Furthermore, the students' living conditions at their homes during the Covid-19 pandemic also contributed to this vulnerability. Most students live in informal settlements where many people share a small living space. This made e-learning a near impossible task. Three participants had this to say:

It is pretty obvious that if I feel that I am not fully computer literate, should I be expected to do well on online assessments? (Gerald, 16-year-old male)

[D]uring the pandemic, I was living at home with my mother, grandmother, two aunties, four siblings and three cousins. We all shared a two bedroom house. Hence in addition to not being comfortable with eLearning, my living condition made it difficult to attend, concentrate and study. All these made me extremely scared of online assessments. (Rachel, 17-year-old female)

The majority of the first-year students who come from disadvantaged backgrounds experience many challenges during their early days at university. One is expected to adapt to the new environment. We encourage each other not to give up and blame our previous circumstances. Assessment time is always a challenging period for any student and the online assessments are not different. It is upon each student to make the best of opportunities presented to them. (Makhosonke, 18-year-old male)

The third theme reveals that because most students are not conversant with e-learning, they are feel extremely scared of online assessments making them not perform well.

The current study has therefore provided new knowledge in the context of the DUT regarding the perception on e-learning based on the experiences of first-year students from previously disadvantaged groups.

Figure 1 is a visual illustration of the interlink between important elements that are aimed at building an environment that is conducive to teaching and learning (Adkins 2013) and that forms part of the recommendations.
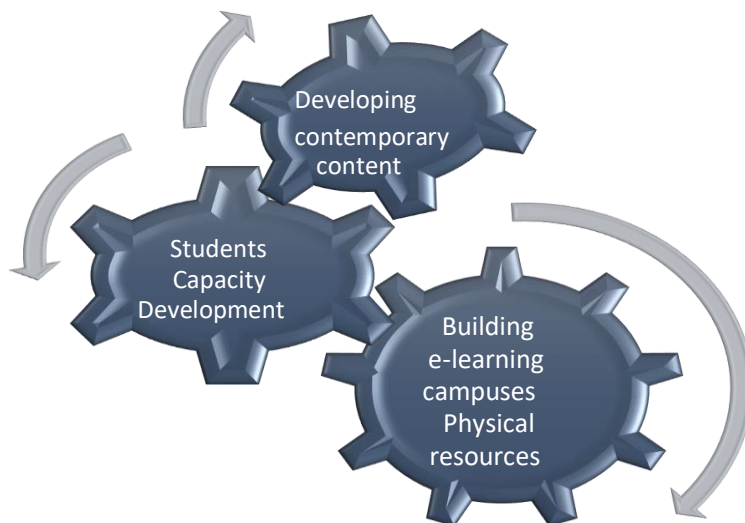

Figure1: Institutional responsibility in building e-learning campuses

Recommendations and Conclusion

Building E-Learning Campuses: Physical Resources

It is the primary responsibility of HEIs to build on- and off-campus student-friendly environments, complete with relevant teaching and learning resources. The participants lamented the inadequacy of computer laboratories and off-campus resources especially during the Covid-19 pandemic. Dedicating specific computer laboratories for the exclusive use by first-year students and making these accessible throughout the day and night would enable students to confidently build competence in the manipulation of online resources. Furthermore, providing first years with laptops is also crucial from now onwards owing to the Covid-19 pandemic.

Students from disadvantaged backgrounds generally do not have the financial muscle to purchase data to access online resources on their handheld gadgets such as cell phones. Making Wi-Fi readily accessible would enable students to work at their own pace and engage with their colleagues in the journey of discovering online learning. Connectivity to the internet enables student access to similar resources that their teachers use.

Student Capacity Development

First-year students, more especially those from disadvantaged backgrounds, benefit from institutions that provide basic and advanced computer literacy training courses. This would enable students to access relevant online learning and teaching resources with confidence and without feeling alienated or disadvantaged as compared to other more advantaged colleagues. Training facilitators are expected to be empathetic and responsive to first-year students' challenges and experiences when handling technology for the first time. The training has to cover both learning and assessment. Mostly, first-year students are only trained on the way in which to attend and access e-learning but no training is done on assessment.

According to King and South (2017), assessment tasks are to be formulated in a way that promotes creativity, containing the framework that enable students to exhibit the real-world knowledge and skills they developed.

The National Forum for the Enhancement of Teaching and Learning in Higher Education (2020) provides a number of guidelines to make online assessment accessible and inclusive:

- The assessment guidelines should be clear and with realistic expectations.

- The level of complexity of the assessment task should be in line with the digital expertise of the students.

- Students should be provided with a sample assessment submission so that they have clarity on what is expected of them.

- Submission time lines for online testing should make accommodation for students with disabilities. Alternative online tests with assertive technologies may be arranged to accommodate differently abled students.

- Opportunities for peer assessment should be provided to enable students with opportunities to support each other in preparing, discussing and developing their assessment submissions.

Without access to the internet, many e-learning projects in African countries are throttled before they even begin. Providing all the students with internet access is a very expensive proposition for most African governments, more so in the case of rural centres and remote areas, where internet connections are bound to be erratic, if available at all.

Development of Relevant and Contemporary Academic Content

Content development is a critical area that is too often overlooked. The majority of tertiary institutions still use textbooks from the United Kingdom and the United States of America and there has not been a consistent drive to develop local content. Given the unique facets of Africa, the diversity of languages and cultures, and the continent's specialised needs, there is a great opportunity for African countries to develop targeted plans for content development. Language and content are currently not appealing to young people. King and South (2017, 13) posit that universities should develop technology-based programmes that can enable transfer of credit between institutions more seamless and provide better quality assurance.

Students enter university with positive minds and motivation to achieve success, which would possibly bring about changes in their lives and those around them. Their innate resilience provided them the ability to construct reality before them to their level of understanding and gives them the impetus to strive to adapt to the latest modes of teaching, learning and assessment. That resilience emanates from doing the most to progress from their poorly resourced previous schools and impoverished townships ravaged by crime and a lack of service delivery of basic necessities such as water, sanitation and housing. Student-centred universities create a welcoming and supportive environment that dismisses the narrow perception that institutions are more engaged in complicated academic discourses and neglect difficult transitions that first-year students are going through.

The students who participated in the study acknowledged that their institution is making strides to provide the means to make the transition for first-year students into the university as seamless as possible. However, some students from disadvantaged backgrounds fall through the cracks as a result of inadequate resources. It is incumbent upon HEIs to ensure that teaching and learning take place in environments that are conducive to teaching and learning. The teaching and learning environment has to be adapted based on the educational and technological backgrounds and basic needs of students. Providing resources such as adequate computer laboratories or laptops, readily available Wi-Fi and off-campus data access is a necessity.

The redress and social justice imperatives of a democratic government in South Africa can only be achieved through the alleviation of illiteracy and historical poverty in the country. The means to this end is undeniably education hence the mandate for the government to not only provide education, but to also facilitate the preparedness of students for higher education through the provision of adequate resources that empower student learning, which in the context of this study refers to the availability of technology in HEIs.

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