Students' Perceptions of Availability of Infrastructure and Resources in a Faculty of Education: A Transformative Agenda

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Abstract
The history of the South African education system, with its differentiated system during the apartheid era, is a thorny one. During this era, the government used different funding formula for White and Black universities, which meant that university per capita and concomitant infrastructure and resources were distributed unequally. After 1994, the country obtained its democracy. Consequently, there was a need to adjust funding so that universities could receive equitable distribution of infrastructure and resources. Nonetheless, literature suggests that it is a challenge for Black universities that were poorly resourced to catch up, in spite of the efforts of the State to close this gap. Ample research shows that infrastructure and resources influence teaching and learning. This study investigated students' perceptions of availability of infrastructure and resources in a Faculty of Education. The research question was: What are students' perceptions of availability of infrastructure and resources in a Faculty of Education? A purposive sample of 254 Bachelor of Education students was used. Quantitative data were collected through close-ended questionnaires using the Likert scale with five categories. For data analysis, descriptive statistics were performed on each question in the questionnaire to determine the mean score and the distribution of scores, which were presented in the form of bar graphs. Results revealed that the majority of students perceived availability of infrastructure and resources negatively. Since infrastructure and resources influence teaching and learning, transformation of the teaching and learning spaces needs to be prioritized to provide high quality education and success of all students.

Keywords: perceptions, infrastructure and resources, teaching and learning.

Introduction

Before 1994, South Africa had a differentiated higher education system in accordance with the four race groups: Whites, Coloureds (people of mixed race), Indians and Blacks/Africans. This differentiation meant that, depending on the race, the State per capita spending on universities was different, with historically White universities (HWUs) receiving a lion's share while historically Black universities (HBUs) were the least funded. University per capita spending for the other two groups (Coloureds and Indians) was in the middle. Bunting (2002) explains that in many cases, the funding formula for universities that was applied during the apartheid era did not address or overcome disparities. Instead, it ensured that the more advantaged institutions or HWUs (for example Universities of Cape Town, Stellenbosch and Pretoria) were provided with adequate infrastructure and resources (e.g. libraries, laboratories and computer facilities). Clearly, with this differentiation, the quality of teaching and learning that students received from different universities was fraught with disparities (Council on Higher Education (CHE), 2004). Evidently, it was Black students who attended HBUs who received inferior education.

When South Africa obtained democracy in 1994, the State, under the leadership of the first Black President Nelson Mandela and his Rainbow Government, sought to transform the higher education landscape. The release of the White Paper 3-Transformation in Higher Education in South Africa (Department of Education (DoE), 1997) had brought the hope of bringing equality of opportunity, access and success for all students in South Africa. One of the areas that the State had to prioritize was transformation of infrastructure and resources for especially HBUs that had been seriously under-resourced during the apartheid era. The assumption was that improvement of infrastructure and resources would invariably improve the quality of education in these institutions. The State has made great strides to improve infrastructure and resources in the universities that were severely under-resourced during the previous dispensation. However, because transformation of the higher education system brought about 'massification' of education (Kraak, 2001) to the Black masses of students who had previously had no access to the White universities, this meant that the previously advantaged White universities could not contain the number of students who flocked to them. The situation of poor infrastructure and resources in higher education has not improved much. The Department of Higher Education and Training (DHET) Green Paper for Post-School Education and Training (2012, 11) notes persistent apartheid effects as follows:

While our leading universities are internationally respected, our historically black universities continue to face severe financial, human, infrastructure, and other resource constraints.

Increased global access to higher education has not been matched with increased growth in resources and infrastructure in institutions of higher education (Hubball & Burt, 2004). Mohamedbhai (2008) reiterates the fact that 'massification in the [South African] institutions has occurred without an accompanying increase in resources – financial, physical and human – which has had a direct impact on the physical infrastructure, the quality of teaching and learning, research, quality of life of the students, etc.' In 2004, the South African government acknowledged that despite increasing appropriations, it was not succeeding in improving infrastructure and

resources to the level that was needed (Wangenge-Ouma & Carpentier, 2018). Consequently, the Government gave a mandate to the universities to introduce caps on student enrolments, as they were exerting pressure on the infrastructure and resources. The Government argued that,

the [South African] higher education system has grown more rapidly than the available resources. The resultant short-fall in funding has put severe pressure on institutional infrastructure and personnel, thus compromising the ability of higher education institutions to discharge their teaching and research mandate (Department of Education, 2004, 3).

Infrastructure and resources are integral in effective teaching and learning and creating friendly learning spaces, as well as for quality education to be afforded to a country's citizens. In addition, infrastructure has a tremendous influence on whom and what students become: their identity- after they graduate. Students tend to identify with the infrastructure of the institutions from which they studied long after they graduated. As an alumnus of Northern Illinois University (NIU) in Illinois State, I still talk about and identify with, for example, the Altgeld Auditorium, the Founders Memorial Library and the Martin Luther Statue as if I was a student there yesterday, yet I graduated from there two decades ago. These infrastructures are deeply ingrained in my mind and they a symbol of the quality of education I obtained from NIU. In fact, they are NIU to me. Therefore, graduates always relate to their past education by the infrastructure and resources that were provided to them as students. It is clear from above that the issue of disparities in the distribution of infrastructure in higher education is a political one that should be high on the transformation agenda. Research still needs to be done to investigate the current situation in relation to availability of infrastructure and resources in higher education institutions, in order to determine if transformation is/has taken place in this regard long after South Africa obtained democracy and after the implementation of the White Paper 3- Transformation in Higher Education in South Africa (DoE, 1997) that was released two decades ago.

Studies have been conducted in South Africa to investigate challenges in the South African higher education, especially as it related to the transformation of higher education after 1994 and in relation to infrastructure, as shown above. However, few have looked at the availability of infrastructure and resources in higher education from the perspective of students. This study purported to close this gap. The purpose of this study was to investigate student teachers' perceptions of availability of infrastructure and resources in a Faculty of Education. The research question was: What are student teachers' perceptions of the availability of resources in the Faculty of Education?

This study is significant. It will probably challenge university management and policymakers to rethink ways of putting infrastructure and resources high on the university agenda, especially if the findings of this study suggest that they are not adequately available.

Literature review

Relationship between infrastructure and resources and teaching and learning

Infrastructure and resources are critical for effective teaching and learning. Khumalo and Mji (2014, 264) argue that 'The lack of resources is a critical factor in education because it may negatively affect the learning and teaching processes within the classroom'. South African institutions of higher education are known for having increased access without a matched increase in infrastructure. In an effort to increase infrastructure and concomitant access to higher education, the Department of Higher Education and Training (DHET) opened two new universities in Mpumalanga and the Northern Cape provinces in 2016 (Mathebula & Kalitz, 2018). The assumption was that additional universities would reduce the burden of inadequate infrastructure and save citizens from these two provinces from traveling far away to receive education.

In their study on school infrastructure and resources and its impact on the academic performance of primary education students in Latin America, Murillo and Román (2011) found that availability of basic infrastructure and services, and of books in the library and computers in the school have an effect on the achievement of primary education students.

Mbembe (2016, 30) echoes Murillo and Román (2011), arguing that:

To some extent, a good university education is impossible without an extensive material infrastructure/architecture. Intellectual life can be dependent on the sort of buildings in which conversations take place.

There is some truth in this: in South Africa, some students tend to flock to some universities because of their external appearance and quality of infrastructure. When a student has to choose where they would like to study, it is common to mention the University of Cape Town, Stellenbosch University, Wits University or the University of KwaZulu-Natal. Coincidentally, the four universities are HWUs that students and parents know have all the facilities one can think of.

The State is dragging its feet to bring parity in relation to infrastructure and resources in the different universities. One of the reasons for this sluggish improvement is, as pointed out earlier, that increase of access to higher education did not match improvement in infrastructure and resources (Wangenge-Ouma & Carpentier, 2018). The second reason relates to the block grant that universities receive from the State, which do not make provision that HBUs were previously disadvantaged than their HWU counterparts. Clearly, this one-size-fits-all approach to funding is not serving the previously disadvantaged HBUs well.

Higher education institutions in South Africa have developed ways of coping with infrastructural and resource inadequacies. For example, in some parts of South Africa, public HEIs have established voluntary regional consortia. These take the form of, for example, shared academic programme offerings, and shared infrastructure in such areas as libraries and information and communications technology. Regional consortia include, for example, the Cape Higher Education Consortium (CHEC, Western Cape),

the Eastern Cape Higher Education Association (ECHEA), the Eastern Seaboard Association of Tertiary Institutions (ESATI); and the Forum of Tertiary Institutions in the Northern Metropolis (FOTIM) (CHE, 2004). There are other efforts to share infrastructure, such as using well-equipped infrastructure of one university by another during the holidays when students are away. Clearly, universities are not passively waiting for manna to fall from heaven but are acting as agents towards finding solutions to the infrastructural and resource dilemmas they are faced with.

Research Methodology

This quantitative case study solicited students' perceptions of the availability of infrastructure (e.g. science and computer laboratories, library) and resources (e.g. ICTs, books, Wi-Fi, clinic and counselling services) in the Faculty of Education they were enrolled in. A Likert-scale with the categories: strongly disagree, disagree, neutral, agree and strongly disagree was used to collect data. The questionnaire consisted of a 13 items (see Appendix 1).

The sampling procedure was convenient and purposive. It was convenient because students were easily accessible, as they were enrolled in the same Faculty from which data were collected. The sampling procedure was also purposive because participants were selected on the basis that they possessed the knowledge that was relevant to the study. A sample of 254 students from second and third year cohorts responded to the questionnaire. The first years were excluded because the researcher felt that they had not been in the program long enough to provide essential data. Similarly, the fourth years did not participate in the study because they were in the schools for teaching practice during data collection.

To avoid bias or effect on students, the researcher requested a colleague to collect data on her behalf. The colleague taught only four of the six groups of second and third year students. Consequently, the sample did not include all second and third year students enrolled in the teacher education program, but only those whom the colleague taught and had access to. The questionnaire was administered manually, because students tend to be reluctant to fill them out online. To avoid distracting students, questionnaires were administered before the lectures began. Before the questionnaire was administered, three colleagues in the Faculty of Education tested its validity and reliability. The researcher used feedback obtained from them to improve the quality of the original questionnaire.

The researcher followed several procedures in handling data. In the cases where participants had selected only one category (for example, 'Strongly Agree') throughout the questionnaire, those questionnaires were discarded. In the case where participants ticked off more than one category of the same question (for example, 'Strongly Agree' and 'Disagree'), that response was eliminated or discarded and not counted. Overall, ten questionnaires were discarded due to either of the two reasons.
Data analysis involved performing descriptive statistics on each question in the questionnaire to determine the mean score and the distribution of scores for each one. Thereafter the questionnaire was divided into five components and an Item Analysis performed on each subset. This was to determine Chronbach's Alpha describing the overall relationship among the questions in the subset and the multiple correlation (Rsquared) of each question's scores with the other questions. A low Chronbach's

Alpha would indicate that the questions in that subset addresses different questions. Similarly, a low multiple correlation would indicate that the question addresses a different aspect than the others. All analyses were performed using the NCSS V11 statistical package (NCSS 11 Statistical Software, 2016). Data were presented in the form of bar graphs.

Ethical considerations were made. Students were informed about the purpose of the study. Verbal consent was solicited before the questionnaire was administered. Students were informed of their right not to participate in the study or to withdraw from participation any time if they felt uncomfortable. They were also informed about the anonymity clause and that the study did not involve harm. Information was shared with them that data will be used for only research purposes and that data will be stored safely for a period of three years, after which it will be destroyed.

Results

Profiles of participants

In the first section, profiles of participants are presented, followed by the presentation of the Chronbach's Alpha. The students who participated in this study were in their second and third year of the Bachelor of Education degree studies. They were studying to become secondary and high school teachers. Half of them were Coloureds while another half was Black. Their gender was also almost split into half and half, but overall there were twenty more females than males.

Cronbach's Alpha

With regard to Cronbach's Alpha, correlations were low due to the different responses by different students to the questions asked. This makes it difficult to generalize the results to other similar contexts. There was an equal split in students' experiences but it did not mean that their experiences with each item were similar.

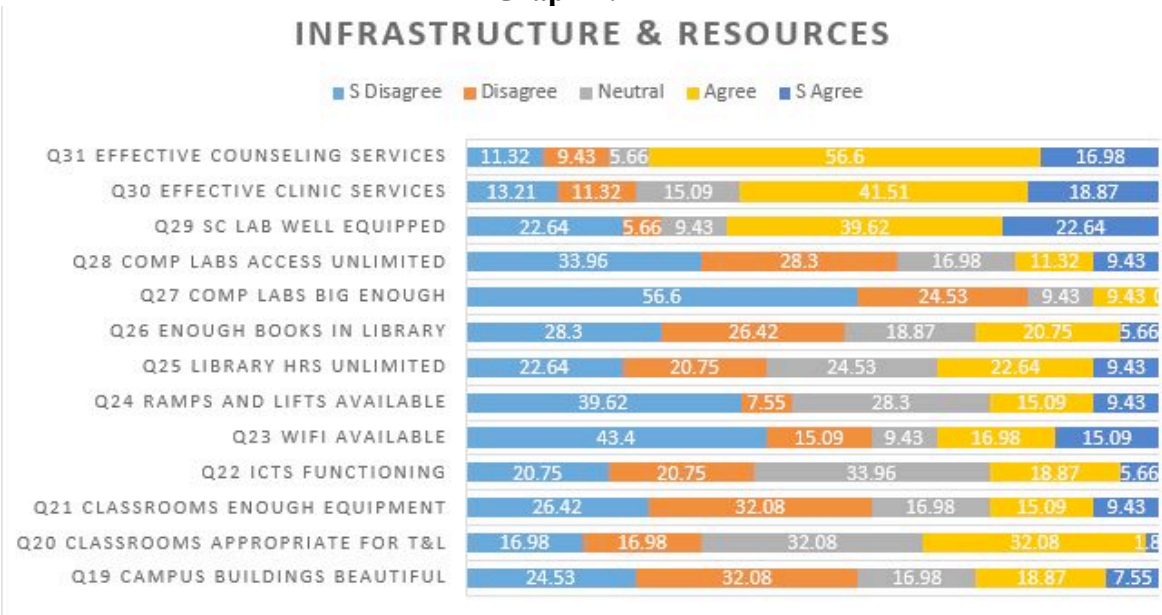
Students' perceptions of infrastructure and resources

Infrastructure and resources are the backbone of education, partly because the teaching-and-learning process does not take place in a vacuum but is highly influenced by the environments in which it takes place. Overall, thirteen items were included in the questionnaire (Appendix 1). Results indicated that participants' perceptions of infrastructure and resources were not favourable. The highest number of participants (81%) perceived the size of the computer labs (Q27) as insufficient to accommodate students in their faculty. Except for the clinic and counselling services (Q30 and Q31) and well-equipped science laboratories (Q29), students generally perceived availability of infrastructure and resources as poor, as shown by the high numbers of those who disagreed, compared to those who agreed or were neutral. In fact, students tended to assert their voices and to be vocal about how they felt, as shown by low percentages of those who selected neutral. Nonetheless, participants were torn with regard to whether or not classrooms were appropriate for teaching and learning (Q20), with 34% disagreeing and agreeing, versus 32% who were neutral on this item. It would appear that participants' perceptions of the services rendered by the clinic and counselling services (Q30 and Q31) were generally good. This could mean

that their general welfare is well taken care of. In this era of digital technology, it is disconcerting that participants perceived availability of Wi-Fi (Q23) and functioning of ICTs (Q22) in a negative light. Similarly, their perceptions of insufficient computer lab spaces (Q27) is disappointing when weighed against the backdrop that universities should be preparing teachers for the 21st technology era.

Quite ironic was to note that in this day and age of inclusive education, the highest number of participants (47%) responded that ramps and lifts were not available while 28% were neutral and only a minority (25%) perceived them as available. Similarly, there was irony in the fact that while participants perceived the science labs as well-equipped ((Q29), as shown by 62% who agreed, they perceived access to them as limited (Q28), as revealed by 62% who selected disagree on the item 'Lab access is limited'. Quite disheartening was to note that 43% of participants' perceived the library hours (Q25) and 55% perceived availability of books (Q26) in a negative light. Limited books, coupled with limited library hours is serious cause for concern and spells disaster on relation to high quality teaching and learning. The graph below illustrates the graphical representation of participant's responses to the questionnaire.

Graph 1:



Discussion and conclusion

The purpose of this study was to investigate students' perceptions of the availability of infrastructure and resources in a Faculty of Education in a South African university. The argument raised was that infrastructure and resources are political in the context of the South African higher education landscape and should be high on the transformation agenda. This is particularly important in the South African context, where disparities created by the apartheid era still exist and where, during the old dispensation, differentiation of funding was dictated by race. The consequences were inequalities in the quality of education for White and Black students. Granted, literature shows that the State has made great strides to redress the inequalities of the past. Nonetheless, the results of this study paint a bleak picture, and have serious

implications for the transformation of higher education in South Africa, in as far as provision of infrastructure and resources for universities is concerned.

Evidently, students' negative perceptions of availability of infrastructure and resources reflect negatively on the quality of education provided to the students in this faculty. Literature has shown that there is a symbiotic relationship between infrastructure and resources and quality education (Murillo and Román, 2011; Mbembe (2016). Therefore, in order to uplift the quality of teaching and learning and to bring about transformation, policymakers and the management need to take a serious look at how to increase infrastructure and resources in this faculty. More studies need to be conducted to investigate the extent to which other universities, especially those that were disenfranchised by the apartheid system, are equipped with infrastructure and resources. Other studies would need to investigate the relationship between availability of infrastructure and resources and student performance.

Appendix 1

Questionnaire

Questionnaire

	Strongly Disagree		Disagree	Neutral	Agree	Strongly Disagree	
Our campus buildngs are attractive and beautiful							
Our classrooms are appropriate for effective teaching, learning and classroom management							
There is enough equipment (microphone/acoustics; Whiteboards; chalkboards) in our classrooms							
ICTs (computers, Whiteboards, projectors) are in working order to be used during teaching and learning							
Wi-Fi Is available for use in the classrooms and on campus							
Our campus has ramps and working lifts that make it user-friendly for people with disabilities							
Library hours allow students unlimited access							
We always find the books we need in the library							
Our campus computer labs are big enough to accommodate all students in our faculty							
Access to computer labs is unlimited (is always available)							
The Science labs are wel equipped and maintained							
The Clinic provides good services and support							
Counselling services are effective							

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