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The State of Virtualisation at a Selected University in the Eastern Cape Province of South Africa

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Abstract

Virtualisation in higher education emerged as a new imperative after the covid-19 pandemic as well as the technological revolution. Technological revolution and virtualisation have, however, put attention once more on socioeconomic inequalities in South Africa. Inequalities in readiness and adoption of digital systems have been observed along geographical as well as socioeconomic dimensions in resulting in a need to inquire on the state of virtualisation in different contexts. The study sought to describe the state of virtualisation at a selected university in the Eastern Cape Province which is considered one of the poorest in South Africa. Specifically, the state of virtualisation was described in terms of three dimensions, namely; (1) perception of academics on virtualisation, (1) attitudes of academics on virtualisation and (2) university initiatives in promoting virtualisation. The study adopted a qualitative design based on interviews with nine (9) academics from a selected university in the Eastern Cape. The perceptions of virtualisation were found to be consistent with those of the literature where virtualisation was considered to imply remote teaching and learning, digitalisation as were as non-physical educational strategies. Virtualisation was found to be associated with both negative and positive attitudes. Positive attitudes were related to views that virtualisation was flexible, associated with learning everyone and increased access to education. Negative attitudes were found to stem from information overload as well as sentiments that virtualisation needed specialised resources and training. It was found that University has done considerably better in training academics as well as in providing them with relevant tools for virtualisation. The study recommends strengthening virtualisation to ensure every academic benefits from using it.

Keywords: *Virtualisation, higher education, remote learning, university, technology.*

Introduction

The aim of the study was to describe the state of virtualisation at a selected university in the Eastern Cape Province of South Africa. The Eastern Cape Province. This study was relevant considering that virtualisation of the academic sector has become a key concept in educational transformation in the 21st century [1]Educational transformation in South Africa first involved the emphasis on shifts from the inequalities that characterised apartheid in the post 1994 era before the setting in of the Fourth Industrial Revolution (4IR) which saw growth in the use of Information and Communication Technologies (ICT)[2]. The 4IR resulted in a focus for innovation and technological adoption in the higher education system. The Covid-19 pandemic stressed on the increased use of ICT for continued education during the lockdowns and social distancing necessitated by the pandemic. Virtualisation has then become a critical agenda for educational transformation in the present environment. Studies on the virtual readiness and state in various educational institutions have increased [1;2]. In particular, there have been observations that there is a virtual inequality observable in respect of various social groups and geographical dimensions. In view of the digital and virtual divide, the Eastern Cape Province is considered rural and it lags behind in many socioeconomic categories relative to other provinces. As such, it was critical to explore the state of virtualisation at an educational institution in that province to inform its future needs and form the basis for initiatives needed to promote virtual and digital equality in South Africa.

Literature review

Virtualisation

Adoption virtual educational systems and strategies to enhance both the quality and access to education has increased worldwide [3]. This is considered a necessary transition. In South Africa, virtualisation has also increased through at a pace which still reflects structural differences which has been previously present in

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the population. Virtualization has been considered in the form of various concepts that describe limited face-to-face mode in teaching and learning. [4] study considered virtual teaching in the form of digital learning. In explaining the transition to digital modes of teaching and learning,[4] explain that there is a distinction between traditional teaching and Internet-based teaching and learning. In doing so, the Internet is identified as the disruptive factor that has facilitated the shift from face-to-face physical learning to digital learning. What is clear is that virtualization is a departure from traditional forms of teaching and learning where conduct is direct and physical.

Conceptualized virtualization of the education sector in terms of the digitalization of education. On the other hand, [5] describe the concept of virtualization in terms of e-learning. To [2], virtualization has been described as remote learning to explain the physical distance between students and their teachers. Despite the myriad of terms adopted by different scholars across the globe, the concept of virtualization is explained by the shift to non-physical forms of learning and instruction. In the same manner, [6] focus on the adoption of an e-textbook or a digital learning resource to explore the transition to virtualization systems. The development of the virtualization concept can be virtually traced within education. When considering the historical roots of higher education, [7] argue that racially entrenched views and attitudes affected the provision of skills among Africans. In other words, skilled personnel were expected to be of European races. It was an education system that was meant to strengthen the position and domination of whites in South African society. Africans received Bantu education, which limited them to blue-collar jobs. With the attainment of independence in 1994, the focus changed to the transformation of the entire society and its institutions. Higher education was significantly transformed as there was an urgent need to develop previously disadvantaged groups and advance their education. This was especially important, given that South Africa is one of the most unequal societies in the world, characterized by a huge gap between the rich and the poor.

The State of Virtualisation in the Higher Education Sector

In the view of [8], virtualization means the use of technological systems that lead to the adoption of remote arrangements as opposed to physical work designs. As observed in [9], information technology has permeated the South African HE system and I the main factor aiding virtualisation. Virtual work teams have become a popular phenomenon in the HE system. Some theorists highlight the weaknesses of virtualisation, which include its communication weaknesses and rich social interaction when compared to face-to-face systems [10]. Considering that South Africa's education system faces significant challenges owing to the need for decolonisation and improving skills, the essence of virtualisation in this matrix seems to be a critical element for scrutiny [9]. Results of the use of Web 2.0 and the transition to Education 4.0 have attracted mixed conclusions among researchers [11]. Most of these studies have focused on the benefits of virtualisation on students. Virtualisation is facilitated by technological infrastructure that includes the Internet, computers, websites and other electronic applications whose use and effectiveness tend to influence remote learning and teaching. Prior research on high workplace virtuality has found that loneliness and conflict management inadequacies affect productivity within such systems [10]. Health and wellness, including stress, have also been found to be critical factors associated with high virtuality [10]. This has implications on employee job satisfaction within organizations.

Methodology

The state of virtualisation at the higher educational institution was considered to be a phenomenon that can be understood through interaction with academics who are affected by it. As such knowledge of the state of virtualisation was deemed to be retrievable through interacting with people involved, and interpreting their subjective or qualitative views to establish the truth of the phenomena. According to [12] and [13], the qualitative approach is based on the understanding of an object or research problem. The approach believes knowledge is achieved through understanding and interpretation of concepts. The approach is employed by researchers to observe or interpret an environment with the aim of arriving at a grounded theory. The population for the study consisted of academic personnel at a selected HEI in the Eastern Cape province. The current study followed non-probability sampling methods of convenience and

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purposive sampling to collect data because these allows focus to be put on the specific targets who can be reached and who can provide useful information in consideration with the study aim. In qualitative data, the guiding principle was based on the concept of saturation. According to [14], saturation is when a researcher gets repetitive responses and nothing new emerges. In this study, saturation was achieved after the researcher had conducted interviews with nine participants. Table 1 shows the participants and their faculties

Table 1: Interview respondents

Faculties	Lecturer	HODS
Faculty of Management Science	1	
Faculty of Engineering and Technology	1	1
Faculty of Education	1	2
Faculty of Natural Science	1	
Faculty of Humanities, Social Science and Law	1	1
Total	5	4

Results of the interviews were manually transcribed and then thematically analysed to yield the findings presented in the next section.

Findings

In order to describe the state of virtualization at the University, the findings of this study were considered in terms of the three dimensions: (1) perception of academics on virtualisation, (1) attitudes of academics on virtualisation and (2) university initiatives in promoting virtualisation

Perceptions of the virtualisation concept

Figure 1 shows the perceived meaning of virtualisation among the respondents as a summary of the responses provided during the interviews.

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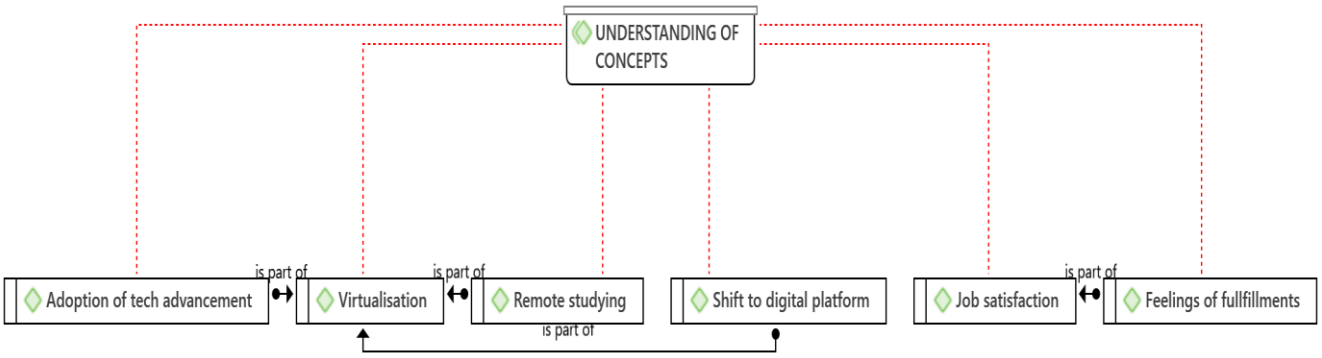

Figure 1. Perceptions of virtualisation concept.

As provided in Figure 1, it was found that virtualization was considered to involve the adoption of technology, remote studying, shift to digital platforms and this was seen to affect job satisfaction as well as feelings of fulfillment with work. Participants 2, 3, 4 and 9 explored their understanding of the term virtualization**.** Participants indicated that this term indicates "operating digitally". Participant 2 expresses that it is about not being "restricted by brick and mortar".

Virtualisation means that Higher Education Institutions should be able to operate digital world and not restricted by brick and mortar.

Participant 4 concurred that virtualization is a change in technology that ensures that people are not bound by geographic location to participant in learning activities.

Change in technology on how things are done. Virtualisation is registering with the university anywhere in the world, attending classes online and being able to get a qualification that is the same as the one offered for fac to face. It has good and bad influence however if you close the loopholes it will improve Virtualisation.

Participant 9 noted that it's not only about teaching and learning moving online but about all of the institution's operations moving to virtual platforms.

Virtualisation is not about connectivity or basic gadgets. Its about the whole entire university operations migrating from face to face to a digital environment. The infrastructure should be advanced to accommodate the entire virtual world.

Participant 8 indicates that virtualization is about the adoption of technology advancement in the transformation of the university.

Advancement in technology, as technology evolves the university has to transform too. The need to produce graduates that are able to function in the 4th Industrial Revolution.

Participant 6 and 7 highlight that virtualisation is about moving to remote studying where lessons and assessments happen virtually.

Its whereby students may not necessarily come to the university buildings for lessons or assessments. students can learn from anywhere. (Participant 6)

Virtualisation in the university is ensuring that teaching and learning and the operations of the university are done online. It is also ensuring that assessments are done differently.(Participant 7)

Participant 8 concludes that virtualisation is about a shift to digital platforms.

This is when the university shifts its operations to a digital platforms.

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The perceptions on virtualisation that are provided above in considered with those in the literature. Virtualisation as in Adam *et al.* (2017:1) and in Maphalala and Odigun (2021:1) has been described by the respondents in terms of technology adoption, remote learning and teaching as well as reliance on non-face to face interactions.

Attitudes of academics on virtualisation

The attitudes of the respondents to virtualisation were summarised in the thematic concept diagram presented as Figure 2 and are described in the paragraphs that follow.

Figure 2: Attitudes of academics towards virtualisation

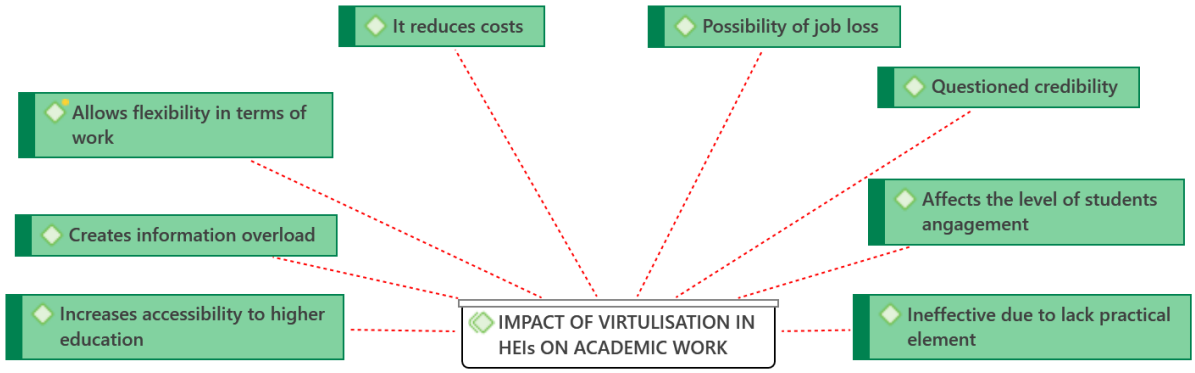

Figure 2 shows that virtualization was found to allow for flexibility and teaching and learning, increased accessibility to higher education, information overload, costs reduction as well ineffective in including the practical component in education. Negative attitudes related to loss of data and poor credibility of virtualization was also noted. Participant 1 expounded that:

"Having to teach practical concepts online affects the quality of teaching and learning. There are applied engineering courses which are impossible to teach online."

Participant 6 concurred with participant 1 that evaluating courses or modules from other disciplines is challenging since certain applications are inappropriate. The mandated use of multiple-choice questions inhibits math ability testing.

"Virtualization affects how assessments are designed and the university is not there yet. Example is in mathematics; blackboard did not have other symbols that are used in maths therefore the only alternative was to set a Multiple-Choice Question (MCQ) assessments which do not show the student's capability to do maths. With maths you mark steps of getting to the right answer. Virtualization failed the department as the LMS was generic."

The data retrieved from the transcripts show that participants agreed that virtualization has a cost-saving benefit. Participant 1 described in detail that the institution no longer spends money on arranging refreshments for conferences because everything is conducted online.

"The reasons for universities to virtualized was due to Covid 19. However now they are taking advantage of cutting cost. i.e., conferences are now virtual than face to face."

Participant 4 echoed the above statement and said:

"Covid 19 pandemic was the reason for Virtualisation however universities have realized that they can save on costs.Venue issues have been resolved. Modules who are theory based can be offered online. Reduced traveling for both staff and students. Being innovative."

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Participants also highlighted unrestricted access to education as a positive consequence, stating that students can recover access from any location. For instance, participant 4 argued:

"Increase of access from anywhere in the world if marketing strategies are reviewed. Increase in income by recruiting international students."

Similarly, participant 5 added that:

"Both students and staff can access them around the clock. Teaching and learning are still progressing."

It was also noted that virtualisation also allowed for flexibility in teaching and learning. Participant 2 detailed:

"Covid 19 introduced us to virtualization. The virtualization is flexible in terms of work done in Higher Education Institutions.Virtualization allows for lecturers to teach from any place. It takes away family time.Line managers are able to call meetings at any time and expect staff to be part of the meetings at any time."

Participant 6 further cited that more than anything, virtualization creates time efficiency.

"Virtualization save time, reduces travelling, solve the venue clashes, can accommodate a bigger number of students in one lesson."

The data process shows that although lecturers and teachers are benefiting from the online teaching, they also experience a bit of set back because there is poor student engagement. Participant 1 contended:

"Online classes are not effective as some students log on and do not participate. Engaging students on the virtual teaching is difficult and they do not take classes seriously."

Participant 2 added that the online approach might be cost effective and easy to access but the downsize of it is the information overload. Everything is taught in short space of time and there is limited time to digest and understand everything at a go.

"Virtualization also creates information overload as it runs around the clock."

Participants noted that there is ambiguity regarding the veracity of online student work. It is asserted that students replicate their work; hence, the accrediting body is uncertain about the student assessments. Participants remarked that there is ambiguity regarding the integrity of online student work. It is alleged that students cheat on their schoolwork; hence, the accrediting body is unsure about the student assessments. Participant 6 for instance, said:

"Not enough support. Assessments conducted online have a credibility challenge. Even the accrediting bodies questioned them. Students copy and the university has not yet come up with solution to combat that."

Participant 7 confirmed the comment made by participant 6 and said that there is no method to demonstrate the credibility of student work.

"Authenticity of assessments is a challenge."

Echoing participant 6&7 is participant 8 who also said:

"Assessments administered on virtual platform are still a challenge. The integrity of them is questionable."

The participants also had concern that robots may replace people and leave them unemployed in a world where everything is conducted online. Participant 7 exclaimed:

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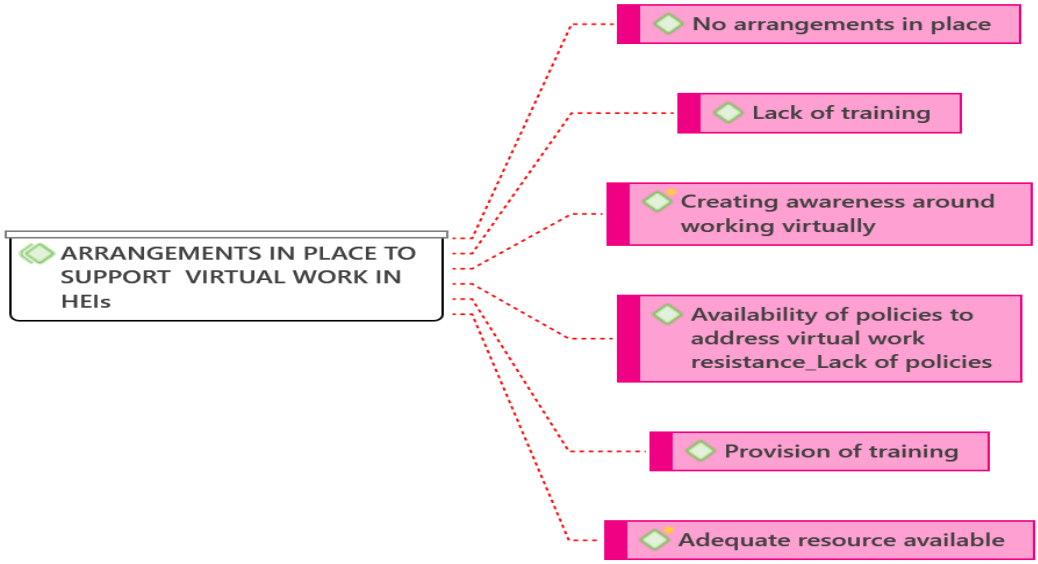
"Possibility of job losses."

University initiatives in promoting virtualisation

The university initiatives in promoting virtualisation were also considered and Figure 3 is a summary of the findings.

Figure 3: University initiatives in support of virtualisation



Participants in the study alluded that there has been support such as given access to resources to be able to perform their work makes them more satisfied with their jobs. It was provided that the University has ensured that:

"Provision of resources or tools of trade to utilise for work in order for me to achieve my goals and perform my duties is also a satisfier." (p1)

"Technical gadgets to work away from the office." (p4)

"Not having the right of tools of trade." (p4)

"'Provision of resources and tools of trade to staff. Ensuring that staff are given autonomy in their work and allow them to be creative and own up to their duties." (p9)

However, what is provided above was not the same reality for all the participants, some shared their frustrations that is as a result of lack of support from the organisations. For instance, Participant 6 complained about "shortage of resources" and too much workload for staff members. Adding to what participant 6 shared is participant 5 who also touched on the issue of biasness in the university. The participant indicated that:

"In our university support staff is treated better than the core drivers of the university operations. Support staff offices are well equipped with all the resources. Their offices are not affected by loadshedding whereas academics' offices are. This creates a huge dissatisfaction." (Participant 5)

Lack of motivation and support in terms of training the staff on how to use the introduced virtual platforms was mentioned by the participants to be also affecting their job satisfaction.

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"The support is not enough. Staff were not ready when virtualisation was imposed on them, although they did their best. Although there was a system, that system was used for few purposes not for teaching and learning. the purpose for LMS changed during the pandemic. However, the support system for LMS was not trained enough to support academics." (Participant 4)

"Even now there is not enough support system for Moodle. When a lot of students log onto the system, the system collapses, then lecturers must look for awkward times to have their assessments written to ensure the system works effectively. Marks disappear, submissions happens halfway while students are busy writing exam. The university technical team could not fix the problem for two weeks." (Participant 4)

"Lack of motivation…Not enough support. We went into this due to the pandemic. There is a lot of confusion within the university. However, when it comes to Moodle academics are not receiving a satisfactory support." (Participant 9)

Participants shared different means of support supplied to do their daily duties. For example, participant 2 alluded that have the necessary resources to perform their tasks.

"University has bought the tools of trade such as laptops, data and routers to ensure that academics can work in a virtual world."

Agreeing in the same breath as participant 2 is participant 8 who added that:

"There is support. Laptops, Routers and Data were provided to academics and students. The software procured by the university to monitor copying still has challenges."

The information supplied showed that the interviewees had the sufficient training to carry out their daily tasks. Participant 5 mentioned:

"' Training and workshops are done by DLT for both staff and students on LMS used."

In similar vein participant 6 shared that adequate training was provided. The participant further specified the platforms they received training from.

"Training was done on Blackboard and Moodle. However, training was generic. It was not programme specific and it did not cater for our speciality."

Moreover, participant 8 also indicated that they received training, and the use of virtual operations are combined with face-to-face interaction not everything is entirely done online.

"Meetings and workshops are conducted virtually there is a 50/50 blended teaching and learning approach the university has adopted. The training was provided on Moodle Moodle, which was facilitated by DLT staff. However, the training was generic, not programme oriented. No training on how to use it for the facilitation of programmes."

Contrary to the above information, participant 2 maintained that they did not receive training, because of the pandemic they didn't have a chance to be equipped, they figured things out as they were happening.

"No training was on Ms Teams. Academics had to self-teach on how to use Ms Teams. Besides LMS, academics were not trained on how to convert their teaching and learning from face to face to virtualisation. No training was done on how to keep students engaged in the platforms."

Participants were asked whether they were aware of any rules addressing virtual work resistance. Some participants said that they were unaware of such policies, while others stated that there are no such policies. For instance, participant 4:

"No virtual work policy is available. Only the learning and teaching was modified to align to Virtualisation."

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Similarly, participant 5 shared that they don't know but the are however teaching assessment policy.

"I do not know of any virtual work policy. I know that Teaching and learning and assessment policy were amended to suit blended learning."

Participant 6 agreed with participant 4

"No Virtual work policy is available. The teaching and learning and assessment policy were modified."

Moreover, participant 9 also said:

"No policy in place. No clear working conditions procedures in place."

Conclusion

The study was founded from the observations that virtualisation has become a phenomenon of interest in all sectors and the higher education sector was specifically selected for analysis. Specifically, the Fourth industrial revolution has widened the available technological tools for virtualisation and the Covid-19 pandemic resulted virtual measures for continued education to be adopted. The results of the study showed that virtualisation is understood to involve remote studying, adoption of technology, shift to digital platforms. Evidence from the study showed that the university has made progress in promoting virtualization including training academics and providing them with virtualization infrastructure. It was also found that virtualization has made both a positive and negative impact on working conditions. Positive impacts of virtualization included reducing cost, allowing for flexibility and increasing accessibility of education. Negative impacts of virtualization were found to include information overload, possibility of job losses, lack of practical dimensions, low student engagement and poor credibility. The university is recommended to ensure that the benefits of virtualization are realized by all.

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