DURBAN UNIVERSITY OF TECHNOLOGY

THE EFFECTS OF LOAD SHEDDING ON MBA STUDENTS' LEARNING AT THE DURBAN UNIVERSITY OF TECHNOLOGY IN SOUTH AFRICA

SICELO LUNGELO BIYELA

APRIL 2025

THE EFFECTS OF LOAD SHEDDING ON MBA STUDENTS' LEARNING AT THE DURBAN UNIVERSITY OF TECHNOLOGY IN SOUTH AFRICA

Submitted in fulfilment of the requirements of the
Master of Management Sciences
Specialising in
Business Administration
in the
Faculty of Management Sciences
at the Durban University of Technology

MR SICELO LUNGELO BIYELA
APRIL 2025

APPROVED FOR FINAL SUBMISSION

Supervisor (Affiliation): _____Date: 09/04/2025

Co-Supervisor(Affiliation): _____ Date: 09/04/2025

DECLARATION

I, Sicelo Lungelo Biyela, hereby declare that this mini dissertation represents my own work, except where indicated in the text. I further declare this work has never been submitted for awarding of a degree to another University or qualification.

Signature

DEDICATION

To my loving wife:

Your eternal support, boundless love, and undying belief in me have been the foundation of my path. This research would not have been feasible without your unfailing encouragement and belief in me. My profuse gratitude to you for being the embodiment of compassion and patience.

And to my late father:

Your powerful but silent demeanour and direction continue to light my path of life. Although you are no longer with us, your legacy and life lessons continue to live in my most vital arteries. This study is a monument to your memory and the profound impact you had on my life.

ACKNOWLEDGEMENTS

Firstly, I would like to express my gratitude to my supervisor, Dr Andrew Ronald Kamwendo, and co-supervisor, Dr Serathi Molokwane. They belong to plethora of academics who possess a genuine dedication to academics.

I also want to extend my sincere gratitude to the Durban University of Technology for turning my dream into reality. This study would not have been possible without the opportunity provided by the institution. I am also eternally thankful to the staff and students for their most valuable participation, which was essential in shaping this study.

Lastly, I am profoundly overwhelmed with gratitude to my mother and brother for their resolute and staunch support throughout the completion of my study. Your encouragement during times of low morale was invaluable, without your genuine love and support I wouldn't have made it to this point.

ABSTRACT

Over the years electricity has been one of the biggest support structures in advancing teaching and learning for universities in South Africa. However, South African universities are currently inundated by several challenges including load shedding. Energy is considered the backbone of an economy's prosperity and progress and plays a crucial role in socio-economic development. Moreover, South Africa is facing an extreme shortage of electricity resulting in an energy crisis which has given rise to social and economic challenges that have threatened teaching and learning processes. This study aimed to determine the effect of load shedding on teaching and learning in the Durban University of Technology (DUT) MBA programme. This aim was achieved by using a qualitative research approach that involved the collection of data using interviews. Data was collected from a census of 35 participants consisting of MBA students and staff in the DUT MBA programme. The findings of this study indicated that widespread load shedding increases electronic resource access concerns. Students complained about frequent online learning platform stoppages, inadequate internet connections, and limited research and communication. Alternative power solution students face these challenges, which hinder academic progress and widen the gap. Interruptions upset students and lowered morale, hampering the DUT MBA teaching. The findings of this study contribute to the broader understanding of the impact of infrastructure-related challenges, such as load shedding, on the core activities at higher education institutions. While the specific context is the DUT MBA programme, the findings provide valuable insights that may be applicable to the education sector more broadly. The knowledge generated from this research can fill an important gap in the existing literature on the intersection of energy supply issues and the delivery of higher education. The findings of this study are also beneficial for both the academic and non-academic community at South African universities broadening the discussion around resourcing concerns in higher education.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

CHAPTER 1: INTRODUCTION

1.1 Introduction

The purpose of this chapter is to present the introduction and background of this study topic, and the effect of load shedding on teaching and learning in the Durban University of Technology (DUT) MBA programme. The problem statement, study aims, study objectives, research questions, significance and scope of the study is presented.

1.2 Background to the research problem

Electricity has been one of the biggest support structures in advancing teaching and learning for universities in South Africa (Pandey, Brelsford and Seto 2022: 198). South African universities are currently inundated by several challenges including load shedding (Atkinson *et al.* 2020:628). The persistent power cuts in South Africa, commonly known as load shedding, has become a threat to the recovery of the country's economy (Streatfeild 2019). Any economy relies on energy for socioeconomic progress. The importance of energy for people nowadays is evident (Atkinson *et al.* 2020:628).

As stated by Statistics South Africa (2023:1), Eskom generates 96% of electricity in South Africa which means that when there is a power outage emanating from Eskom, the life of the economy including education is hindered. The South African Reserve Bank (2023) predicted that load shedding would continue to slow economic and education progress. As Eskom CEO Andre de Ruyter indicated, South Africa would likely face power shortages for the foreseeable future. Statistically, power cuts take place at least two times a day on about 20 days a month which means that in one year there are more than 700 power cuts in an average South African area, and South Africa loses R180 billion per month (Statistics South Africa 2023:1). South Africa has 26 universities that have an average of 21 000 students, and they all require electricity for teaching and learning as well as administrative work which includes data capturing on their system.

The reliance on the national power grid may pose issues for universities as has been the case for businesses. Consequently, it is of interest to the academic fraternity to investigate the effect that load shedding has on a university's teaching and learning processes. Most universities in South Africa have embedded an MBA programme due

to the high demand for the MBA qualification (Atkinson *et al.* 2020:628). The MBA programme is a programme offered mostly to part-time learners and therefore it is unique in that it relies heavily on limited lectures offered to students in different geographical locations. Moreover, many universities have been emphasising the use of technology in their teaching and learning. As such the MBA programmes have been used to spearhead the introduction of new technology in teaching and learning. The newly formed MBA programme at DUT poses an interesting case since a new experience for the university with the first cohort of students starting in 2020. Therefore, the core question that is at the heart of this research is: what is the effect of load shedding on teaching and learning? This research examined how load shedding affects MBA teaching and learning at Durban University of Technology. Using the MBA program as a case study showed how load shedding influenced teaching and learning at the chosen institution.

1.3 Research problem

South Africa is facing an extreme shortage of electricity which is manifesting as an energy crisis and is causing widespread load shedding. This has given rise to social and economic problems threatening students' learning processes (Atkinson *et al.* 2020:628). South Africa's electricity infrastructure is under pressure owing to maintenance backlogs and failure to add generating capacity to meet economic and social growth. This has led to electricity being one of the major challenges to the education sector, negatively impacting teaching resources such as required minimum time (Muftić *et al.* 2023: 606). Without electricity, students have limited resources. For example, part-time MBA students, especially those enrolled in block lectures, face compounded obstacles during load shedding due to their already limited lecture contact time, reliance on digital platforms, and pressure to balance academic, professional, and personal responsibilities. The Masters MBA programmes that are offered part-time or via block lectures are of keen interest to the researcher since they highlight a group that has limited lecture periods scheduled and as such are likely to be the most affected by load shedding (Rajagukguk *et al.* 2024:46). For educational institutions such as universities of technology with recently introduced MBA programmes, it is unclear how external factors such as load shedding affects their teaching and learning processes. Therefore, this study was designed to close the

knowledge gap surrounding the effect of load shedding on MBA students at a selected university in KwaZulu-Natal, South Africa.

1.4 Aims of the study

This study aimed to determine the effects of load shedding on teaching and learning in the DUT MBA programme.

1.5 Objectives of the study

The main objective of this study is to investigate the effects of load shedding on MBA students' learning at a selected University of Technology in South Africa**.**

The sub-objectives are as follows:

- To assess the frequency and duration of load shedding occurrences during the academic year of interest 2023 within the DUT MBA programme.
- To evaluate the perceptions of students regarding the disruptions caused by load shedding on teaching and learning activities.
- To analyse the extent to which load shedding affects access to electronic resources, including online lectures, research materials, and communication tools, within the DUT MBA programme.

1.6 Research questions

What are the effects of load shedding on MBA students' learning at a selected University of Technology in South Africa?

The sub-research questions are as follows:

- What is the frequency and duration of load shedding occurrences during the academic year of interest 2023 within the DUT MBA programme?
- What are the perceptions of the students regarding the disruptions caused by load shedding on teaching and learning activities?
- To what extent does load shedding affect access to electronic resources, including online lectures, research materials, and communication tools, within the DUT MBA programme?

1.7 Significance of the study

This study can contribute to the broader understanding of the impact of infrastructure-related challenges, such as load shedding, on the core activities of higher education institutions. While the specific context is the DUT MBA programme, the findings can provide valuable insights that may be applicable to the education sector more broadly. The knowledge generated from this research can fill an important gap in the existing literature on the intersection of energy supply issues and the delivery of higher education.

The findings of this study can be highly relevant and beneficial for both the academic and non-academic staff at universities. For academic staff, the insights can inform their pedagogical approaches and lesson planning to better accommodate the disruptions caused by load shedding. They may need to adapt their teaching methods, resource utilisation, and student engagement strategies to ensure continuity and effectiveness of the learning process despite the intermittent power outages. Similarly, non-academic staff, such as administrators and support services, can use the study's findings to enhance their operational planning and resource allocation to minimise the negative impact on teaching and learning activities.

University management can leverage the findings of this study to develop more comprehensive and proactive strategies to address the challenges posed by load shedding. The study can provide valuable data and analysis that can inform decision-making processes, resource prioritisation, and the development of contingency plans. Through understanding the specific ways in which load shedding affects teaching and learning, university leaders can make more informed decisions about infrastructure investments, backup power solutions, and the implementation of alternative delivery modes (for example online learning, hybrid models) to ensure the continued delivery of high-quality education during periods of power disruptions.

1.8 Scope of the study

The study is limited to Durban University of Technology, Business School, MBA students, administrators, and academic staff, located in Durban, KwaZulu-Natal province. Therefore, the research on load shedding's impact on teaching and learning at higher education institutions cannot be applied to all South African universities. Another disadvantage of this research is that it only covers one municipality in

KwaZulu-Natal, South Africa. The research also limits itself to students' and staff's opinions of load shedding's impact on teaching and learning.

1.9 Outline of the study

The structure of this study is as follows:

Chapter 1: Introduction

The first chapter of this study presents the research background, research problem, research aim, research objectives as well as the significance and scope of the study.

Chapter 2: Literature Review

The second chapter discusses existing literature on the effect that load shedding has on teaching and learning. The chapter highlights the definitions of key concepts and main themes of this study such as planned and unplanned load shedding, impact of load shedding, importance of electricity for education, as well as the theoretical foundations for the study. The chapter also presents the research hypotheses to be tested by the study.

Chapter 3: Research Methodology

This chapter will predominantly focus on the research design, describe the population and sample; research instrument (interview) and describe the procedures for data collection and analysis.

Chapter 4: Findings of the Study

The findings from the fieldwork and the analysis of data is presented in this chapter.

Chapter 5: Conclusions and Recommendations

The fifth chapter discusses the findings and conclusions from the survey conducted for this study and presents recommendations arising from therefrom.

1.10 Conclusion

This part gave a general overview of the research. It talked about the background, the study's goals and aims, its importance, the research questions, and the issue statement. At the end of the chapter, the study's reach was emphasised. This chapter set up a strong base for the study and makes it easy to understand everything else in

the study. The next chapter gives a full review of the research on how load sharing affects teaching and learning in general and MBA programs in particular.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This chapter investigated the existing studies on the effect that load shedding has on teaching and learning. This review provides a definition of key terms of the study, before going on to discuss the other main themes of the study. The previous section of this proposal laid the foundation of the study including the problem statement, background, aim and objectives of the study. The literature review is related to the variables of interest, which are teaching and learning, load shedding, and challenges facing the higher learning institutions (HLIs) during the load shedding era.

2.2 Definition of key terms

The purpose of this section is to provide a brief definition of some key terminologies related to the study on the effect of load shedding on teaching and learning in HLIs.

LOAD SHEDDING: When Eskom cannot satisfy too much demand, it utilises rolling power cuts to lessen the load on the power supply system (Masibi 2015:1). Load shedding causes two kind of outages: Unplanned and planned.

UNPLANNNED LOAD SHEDDING: Power cuts are unscheduled interruptions in electrical delivery to a group. Weather, cable theft, ageing infrastructure, excavation, construction projects and illegal energy connections frequently cause this (Schoeman and Saunders 2018: 328).

PLANNED LOAD SHEDDING: Times when the power goes out since energy is cut off at a base or another part of the local grid on a set plan. Often this is since of maintenance, emergency fixes, or to take the pressure off Eskom (Schoeman and Saunders 2018: 328).

MITIGATION: The action of restaurants and other businesses and private individuals to reduce the effect of load shedding through back-up systems or change in operations (Winardi *et al.* 2024:38).

2.3 Background on load shedding

Recently, load shedding has become common in South Africa. South Africa has several socio-economic goals, however Pollet, Staffell, and Adamson (2015:16685) found that it is not meeting them due to difficulties like: 1) electrical supply problems,

2) insufficient infrastructure, 3) inefficient regulatory procedures, and 4) poor government leadership. Despite that, electricity drives economic development. The years of underinvestment in South Africa's electrical supply have caused a shortfall and raised the average cost per unit. The ordinary South African user relies on electricity; therefore power outages have far-reaching socio-economic effects, delay economic development, and interrupt key services like the police (Pollet, Staffell and Adamson 2015:16685).

Eskom generates energy mostly from coal- and nuclear-powered plants. Eskom operates one nuclear power plant, Koeberg, in the Western Cape, and 10 coal-powered stations in Mpumalanga province: Arnot, Duvha, Hendrina, Kendal, Kriel, Lethabo, Majuba, Matimba, Matla, and Tutuka. South Africa gets 80% of its power from coal (Yende 2024:11). Years of Eskom neglecting maintenance have strained the electricity grid (Yakobi and Yakobi 2024:1). In December 2005, a bolt at the Koeberg Unit One nuclear reactor was not tightened properly after maintenance, causing extensive damage to one of the rotors and rendering the reactor non-functional (Di Giovine 2016:1025).

Eskom lost ±220 MW of power imports from Mozambique owing to a technical problem at the Apollo substation in Midrand, mostly caused by an overheated valve reactor. Thus, South Africa's dependency on this electrical supply is high-risk (Steenkamp *et al.* 2016:69). Load shedding for 99 days in 2015 reduced South Africa's GDP by 1.3% (Du Preez 2020:1). Load shedding costs South Africa R2.17 billion per day (National Energy Regulator of South Africa 2015:1), ignoring investment confidence and social trust (Mungai 2019:3).

2.4 An overview of Eskom and its implementation of load shedding

The Electricity Act created Eskom, which is South Africa's main energy source. Over time, Eskom’s responsibility evolved with various legislative amendments. After democracy started in 1994, the national government worked to improve the lives of poor people. The “Eskom Amendment Act No.126 of 1998” changed Eskom's goal to providing low-cost power for economic development and electricity to previously disadvantaged residential houses. The “Eskom Conversion Act No. 13 of 2001” made Eskom a public business in the early 2000s. This was primarily done to better position the electricity supplier to meet challenges posed by the global and market demands

including competition while also enabling it to continue playing its developmental role in the country.

Eskom began power shedding in 2008. The primary cause was inadequate electrical supply to meet national demand (Khoza 2024:345). Over time, Eskom spokespeople cited corruption, internal mismanagement, power station design flaws, capital expenditure shifts due to “state capture,” lack of skills, lack of emergency diesel, lack of maintenance on electricity supply infrastructure, planned and unplanned maintenance, boiler leaks, and poor coal quality. Load shedding of 4 000 MW for four hours was the worst-case scenario between 2008 and 2019. However, load shedding Stage 6 began in December 2019, shedding up to 6 000 MW of power supplies in a six-hour cycle (Bruwer, 2021:1). Since practically all businesses rely on power, studies projected that load shedding costs the national economy US$65.7 million per day (Mbazima, Masekameni, and Mmereki 2022:1287). Despite load reduction, South African SM are also hurt by a poor economy.

2.5 Theoretical background

According to Thomas, Lynch and Spencer (2021:3896), a theory can be described “as a group of related overviews that indicate new observations, which can be empirically tested for the purpose of explaining”. The input-process-output model and the service productivity model (SPM) (Malik *et al.* 2022:1165) have been used to understand and explain how load sharing affects teaching and learning of different subjects. Based on assertion, it is assumed that studies related to load shedding can adopt the SPM as an underpinning theory. The central idea behind the model is that for the delivery of quality services, there must be no interruption in services from the input stage through the production stage to the output stage of service delivery. Load shedding mostly negatively impacts the process, and the output is disrupted, which in turn negatively impacts the processes subsequent inputs. Similarly, the SPM may be applicable to a study on the effect of load shedding on teaching and learning in HLIs.

According to Manamperi *et al.* (2023:1), SPM emphasises service-based activities' input-process-output nature. It highlights that input resource utilisation, service process efficiency, and output quality affect service productivity. The SPM may be applicable to the research on load shedding's effects on teaching and learning when inputs include electricity, digital technology, physical infrastructure, and human

resources (teachers and students). The process element of the model may refer to the teaching and learning activities, including lesson planning, content delivery, student engagement, and assessment. The output may refer to the service delivered in the form of the quality of the learning experience and the achievement of intended educational outcomes by the students.

The SPM highlights that the disruption caused by load shedding can directly affects the input resources, thereby impacting the service process and, ultimately, the quality of the educational output (Khoza 2024:345). For example, the intermittent loss of electricity can disrupt the use of digital technologies, limit access to learning materials, and disrupt the continuity of the teaching and learning process. This, in turn, can compromise the quality of the learning experience and the achievement of educational objectives. This model was selected to frame the study on the effect of load shedding on teaching and learning in universities. It provides a useful theoretical lens to analyse how the disruption of input resources (for example, electricity) can influence the service process (teaching and learning activities) and the overall productivity and quality of the educational service delivered to students.

2.6 The importance of electricity

Any business's operations in the twenty-first century depend on dependable power as a basic input. According to Khoza (2024:345), one of the main obstacles to businesses running in underdeveloped nations like South Africa has been availability to power. Since energy sources significantly affect economic activity, electricity is essential for storage, running operations, manufacturing and equipment/machining powering. "Productivity is not everything, but in the long run it is almost everything," Nobel prize winning economist Paul Krugman said. The capacity of a nation to enhance its quality of living over time almost entirely rests on its capacity to grow its production per worker. Previous studies on the detrimental impact of power outages on the productivity of businesses corroborate the extent of the influence load shedding causes to make small businesses ineffective and unproductive (Manamperi *et al.* 2023:1).

2.7 The importance of electricity for education

According to Matsheta and Sefoka (2023:216), the modern educational system emphasises technology in teaching and learning, so all schools and educational institutions need electricity to meet their educational goals. Electricity is necessary for

the fourth industrial revolution's digital high technology, which will revolutionise the economy, business, society, human life, and most significantly, education. To attain this goal and stay up with current educational systems, a sustainable energy supply is needed to run all equipment and gadgets that demand regular power. Due to nighttime courses, ABET requires illumination, while TEL employs computers and audio-visual equipment that need energy. Therefore, if a school is not electrified, load-shedding-prone, or has no backup power supply, it cannot employ technical gadgets like computers, which limits the current instructional method.

This also disrupts teaching and learning since students' environments aren't comfortable enough. Teachers struggle to teach without power since most of their instructional tools, such as laptops, audio-visual equipment, and other IT devices, need it (Matsheta and Sefoka 2023:216). Both students and teachers require a comfortable, well-equipped classroom with cooling and heating systems. One cannot stress the importance of electricity to education as it is a fundamental resource for the efficient execution of instruction and learning. Digital tools, lights, and other necessary infrastructure supporting contemporary educational practices—all of which run on electricity—are powered by energy systems. In the framework of higher education, the dependence on electricity is especially noticeable as colleges and universities rely more and more on technologically driven teaching and learning approaches to improve the academic experience (Winardi *et al.* 2024:38).

As underlined above, the SPM highlights the relevance of input resources—such as electricity—in the efficient running of service-based operations, including instruction and learning (Yende 2024:11). Like many other sectors, the education sector depends on electricity to enable the flawless integration of technology, access to digital resources, and the development of interactive learning environments (Akram 2022:1). It is thus just as important as any other sector, notwithstanding. Given that these advanced degree programs frequently include a lot of technology-driven coursework, collaborative virtual sessions, and access to online resources, the dependency on electricity is even more prominent in the case of MBA programs. As load shedding has shown, the disturbance of the electricity supply can have a negative effect on the teaching and learning processes, so possibly lowering student involvement, limiting access to learning resources, and causing a general decline in the quality of the educational process. Studies have shown that load shedding might adversely affect

student academic performance, especially in higher education (Manamperi *et al.* 2023:1). The sporadic loss of electricity may throw off class plans, restrict the use of digital resources, and undermine the capacity of professors and students to actively participate in the teaching and learning process (Winardi *et al.* 2024:38). This may therefore result in worse learning outcomes, delays in coursework completion, and generally worse academic performance among MBA students (Akram 2022:1).

2.8 The effect of load shedding on teaching and learning in South Africa

Ngcobo and De Wet (2024:2533) state that load shedding and power outages threaten South Africa's socioeconomic recovery, requiring a swift and long-term electrical solution. Load shedding harms education and other sectors and may slow the country's educational progress (Ngcobo and DeWet 2024:2533). Our capacity to manage the fourth industrial revolution depends on stable electricity. Eskom's limited power capacity has produced intermittent power disruptions, hindering the digital shift. Systems fail regularly during university registration, forcing millions of students to register from home. Students and teachers may have to adjust to online learning again, this time with limited energy (Ngcobo and De Wet 2024:2533). Students are hit worst. Without electricity, pupils can't use their phones for data due to a lack of signal, while others must leave their homes to get power and the internet (O'Regan 2021:15).

Unfairness in our educational system is exacerbated by the electrical crisis and social and economic disparities. Indeed, too many schools lack electricity infrastructure, yet even for those that have, socioeconomic status affects load shedding management without hurting teaching (O'Regan 2021:15). This damage reduction capability applies to both higher education and schools (Rendón and Martínez 2024:1). The Department of Education says load shedding won't impair exams since students consume little power (O'Regan 2021:15). A Department official said the actual writing of exams is not impacted since it is done during the day and uses less energy then. However, the Portfolio Committee on Basic Education chair believes load shedding hinders test preparation. The chairwoman believes load shedding impairs students' matric and NSC test preparation (Dlamini 2021:1). According to the Portfolio Committee on Basic Education chairperson, the Umalusi CEO has called for an urgent solution to the load shedding crisis, which affects both basic education and higher education since most educational activities have been moved online due to Covid-19 (Dlamini 2021:1).

These comments show that load shedding hinders the right to basic education, among other issues. Load shedding may permanently damage educational institutions if not addressed, according to Lee (2021:11). The fourth industrial revolution requires power capacity, which the author believes is required today more than ever. Digital learning is inevitable owing to Covid-19, the author concludes. If the load shedding situation is not remedied, Naidoo (2023:7) says the right to education cannot be achieved.

The school sector in South Africa is facing a major difficulty with load shedding. In South Africa, load shedding—the planned and regulated interruption of electrical supply—has become routine, disrupting educational functions (Winard,2024:38). Load shedding affects faculty and students in many ways. Studies suggest that intermittent power outages may interrupt class schedules, restrict digital resource utilisation, and hinder staff and student engagement in teaching and learning (Yakobi and Yakobi 2024:1). This may lower learning outcomes, delay coursework completion, and lower academic achievement for students, particularly MBA students (Yende 2024:11).

Technology-driven teaching and learning approaches, like those used in higher education, leave the education industry susceptible to load shedding. Modern educational programs, especially MBA curriculum, need continual access to digital resources including online materials, collaboration platforms, and multimedia content (Malik *et al.* 2022:1165).

The loss of energy supply during load shedding might affect educators' capacity to teach. Presentations, simulations, and video-based learning may be disturbed, wasting instructional time and decreasing student interest (Manamperi *et al.* 2023:1). This may lower the quality of education and student achievement, especially in higher degree courses like the MBA.

As load shedding is unpredictable, educational institutions must adjust their timetables and instructional techniques (Manamperi *et al.* 2023:1). This may create tension and irritation among instructors and students, worsening the teaching and learning process.

2.9 Conceptual model

The central idea behind the input-process-output model is that in the context of the delivery of quality education, there must be no interruption in services at all the stages

of service delivery (Muftić *et al.* 2023:606). Load shedding can negatively impact the input, process, and the output states, which in turn may be assumed to negatively impact the overall process.

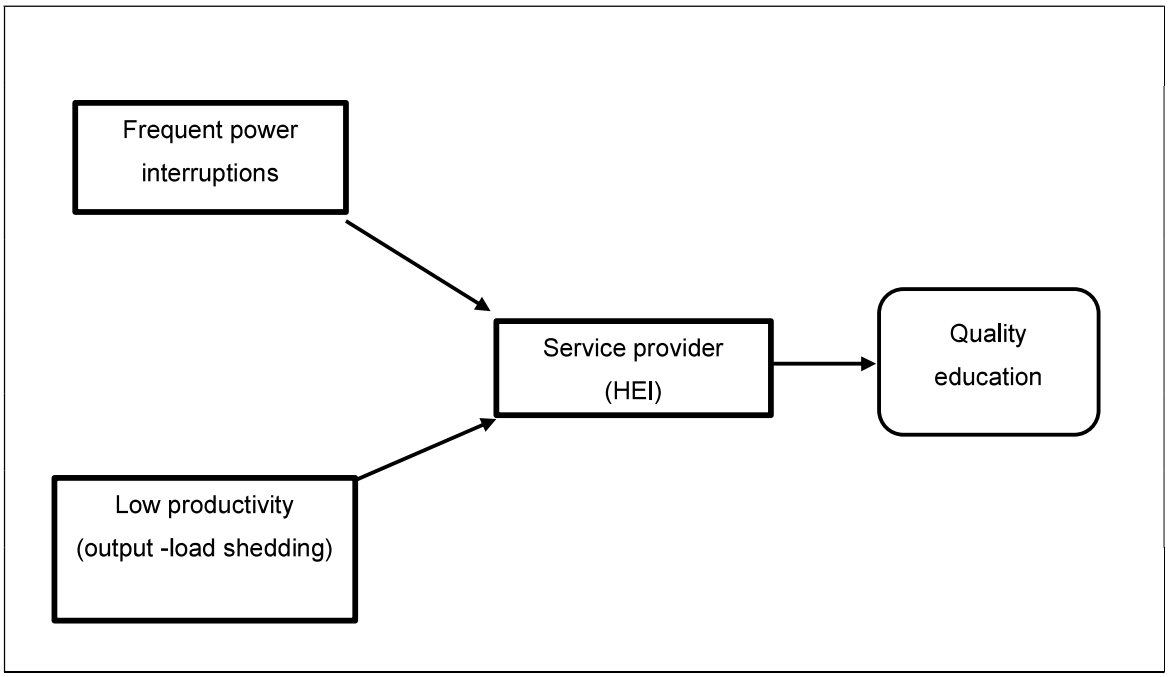

Figure 2.1: Conceptual model

Figure 2.1 shows the input-process-output conceptual model as applied to delivery of quality education. The independent variable of frequent power interruptions (load shedding) leads to recurrent disruptions in electricity supply experienced by many industries in South Africa, including higher educational institutions (Makube 2019:1). Load shedding, also referred to as rolling blackouts, is the intentional interruption of energy delivery to certain areas or regions for a brief duration used to control the mismatch between supply and demand (Rajagukguk *et al.* 2024:46). Using the SPM, one may consider electricity as a vital component in providing education services, thereby greatly affecting their quality and efficiency (Karoly and Walsh 2020:1). One main presumption is that a consistent energy supply guarantees continuous access to digital learning equipment, like computers, projectors, and internet services, which are very necessary for contemporary educational contexts. Furthermore, continuous electrical availability provides a good learning environment by means of appropriate heating, cooling, or lighting systems, thereby improving students' comfort and focus

(Ndlovu 2019). Therefore, the quality of educational services might be seen as essentially connected to the dependability and consistency of power, therefore a basic input that influences the teaching and learning opportunities.

Poor productivity (output-load shedding) is the independent variable. Frequent power outages affect the decreased output or productivity of the teaching and learning activities. The effect of maintenance and repairs on the power supply is the second element in the conceptual framework. Planned or unplanned repair on systems for power production, transmission, or distribution might need temporary power outages to guarantee the dependability and safety of the electrical network (Akram 2022:1). Regular maintenance is vital to avoid equipment failures and increase the general grid's general efficiency, so this is a fundamental component of power system management (Acakpovi, Botwe-Ohenewaa and Sackey 2021).

In higher education institutes (HEIs), scheduled and unforeseen power plant maintenance can affect teaching and learning. Maintenance-related power outages can disrupt lectures, seminars, and labs, wasting valuable teaching time (Alkaldy, Albaqir and Hejazi 2019:149). Sporadic access to digital library materials and online learning platforms may hinder students' ability to interact with course materials and complete academic assignments (Elom *et al.* 2024:1).

Maintenance and repair power outages may also impact advanced university administration and research functions. Disruptions to data collection, processing, and other office activities may reduce institution efficiency and productivity (Monyei *et al.* 2018:68). Too much reliance on generators or other backup power sources during repair may increase running and maintenance costs (Khoza 2024:345).

Service provider (HEIs)' independent variable: This variable shows how HEIs help to moderate the link between the dependent and independent variables. The institutional reaction and policies followed by these service providers might affect the effect of load shedding on the calibre of education.

Quality education's dependent variable is: This fluctuation shows how the independent variables—low productivity and frequent power interruptions—might affect the general quality of education given by more advanced educational institutions. The quality of education at HEIs becomes the dependent variable in the conceptual framework. This

fluctuation shows the general success and quality of the research, instructional, and learning initiatives carried out within HEIs (Yende 2024:11).

Higher education's quality of teaching is a complex topic with many dimensions including student learning outcomes, teacher competency, curriculum design, instructional strategies, and resource availability (Akram 2022:1). These elements are very important in determining the whole educational process and making sure that students choose the required information, abilities, and competences to achieve in their academic and professional activities (Rendón and Martínez 2024:1).

The quality of education at HEIs may be much affected by regular power outages and maintenance-related outages (Winardi *et al.* 2024:38). Power outages could mean that classes, seminars, and lab sessions have to be cancelled, which would reduce the amount of time that can be used for teaching and learning (Yakobi and Yakobi 202l:1). If this happens, students might not learn enough about the course topic and have fewer chances to do experiments and learn by doing. This could also make students less interested in school and hurt their grades (Yende 2024:11). In addition, power outages can make it very hard to use digital technologies like online learning platforms, electronic library resources, and study tools (Monyei *et al.* 2018:68). This can make it harder for students to get educational materials, do research, and finish their tasks. It can also make it harder for institutions to provide administrative and support services smoothly (Malik *et al.* 2022:1165). Manamperi *et al.* (2023:1) say that putting resources into generators during power outages could hurt the level of education. Taking care of and maintaining these backup systems could take money away from things like teacher training, improving the curriculum, and buying materials for teaching and learning (Yende 2024:11).

2.10 Conclusion

This chapter began by presenting a review of existing studies carried out on the effect that load shedding has on teaching and learning. The chapter highlighted the definitions of key concepts and main themes of the study regarding the effect of load shedding on teaching and learning in HEIs such as load shedding, as well as importance of electricity for education. The chapter proposes the research on frequent power interruptions and low productivity due to load shedding negatively impact delivery of quality education. The next chapter focuses on the methodology of the

study on the effect of load shedding on teaching and learning in institutions of higher learning.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

Previous chapter reviewed research on load shedding's impact on HEIs, including the DUT MBA program. The study's research approach is presented in this chapter to achieve its goal. MBA students from Durban University of Technology's Faculty of Management Sciences completed a questionnaire.

3.2 Research philosophy

Philosophy is the set of ideas that people have about how to understand and use data about an event, including how to collect, analyse, and use that data. Saunders, Lewis, and Thornhill (2012:418) say that there are two main ways to do research: the scientific (quantitative) method and the phenomenological (qualitative) method. Exploring human phenomena in real-life situations is what the phenomenological paradigm is all about, while the positivist paradigm looks at social phenomena using quantitative methods (Sekaran and Bougie 2016:13).

Interpretivism is a type of qualitative research that uses the researcher and the person being studied as important tools for figuring out what is going on. It usually involves conversations and monitoring methods. This way of doing things stresses that people are different from real things since they give things meaning, which is what qualitative study is all about (Hepler 2022:1). Interpretivism means stepping into the social world of study subjects, seeing things from their point of view, and realising that different people have different experiences that create different realities (Dzwigol 2020:110).

A qualitative research method was used in this study to get a better understanding of the thing, situation, problem, or event that happened in a realistic setting. This was in line with the interpretivism theory. Also, non-statistical tools and small groups are important in qualitative study (Coy 2019:71). The researcher used a qualitative method to get to know the participants' points of view and gathered data through talks in realistic settings (Nieuwenhuis 2021:22).

Qualitative interpretivism research has benefits like higher truth and less artificiality since the researcher only looks at facts to figure out what happened. A qualitative approach, dependability, validity, and results are often what make knowledge good. This research looked at how load sharing affects teaching and learning in higher

education schools. It used a phenomenological (qualitative) method with an interpretive pragmatism to do its research.

3.3 Research design

Research design organises the topic's inquiry to promote economy and system relevance. The structure, process, and analysis of research design ensures that inquiry and control change are addressed (Creswell and Poth 2016:65). A study may use numerous research designs. Due to its nature, this study used exploratory research. Exploratory research investigates an environment or culture to understand and explain it (De Vos *et al.* 2012:397). Exploratory research seeks clarification or additional knowledge. To explain factors in a scenario or issue, explanatory research is utilised. It means that it is testing whether one variable impacts another (Fife and Gossner 2024:23). Furthermore, exploratory research design refers to a research design in which the research problem is deeply explored to obtain an in-depth understanding of the problem in a natural environment. The design tests the influence of one variable on another where clarity on such influence is needed (Dang, Van Nguyen and Tran 2024:41). In the case of this study, this approach provides in-depth insights into the experiences and perceptions of students and faculty members regarding the impact of load shedding on educational processes. Exploratory study is meant to find new ideas and thoughts (Fife and Gossner 2024:23). The reason this method was picked is that it reduces bias and gives the most reliable results. Open-ended questions were used to collect data to find out what the study question was and what the truth was.

3.4 Research population and sampling strategy.

Cooper and Schindler (2014:1) define a population as the full set of elements or groups from which interferences must be drawn, and sample size as a representative subset. The target population was 40 DUT MBA students and staff. The inclusion criterion was direct involvement with the MBA programme while the exclusion criterion was students and staff not in the MBA programme.

A research study involves sampling a subset of people or elements from a wider population (Taherdoost 2021:10). Sampling collects data from a representative group to reveal demographic trends. This process is essential in research since it allows for the collection of data that is manageable in terms of time, cost, and resources while

ensuring that the findings are generalisable (Taherdoost 2021:10). For this study, a census sampling framework was used where all the target population was included in the sample. The characteristics of the participants are indicated in Table 3.1.

Table 3.1: Breakdown of target population and pilot study participants

Participant Category	Total Target Population	Number in Pilot Study	Number in Main Sample
MBA Staff	15	2	13
MBA Students	25	3	22
Total	**40**	**5**	**35**

In line with the census sampling framework, a sample of 35 participants was used given that 5 had participated in the pilot study. The sample size is posited by Creswell (2018:65) as being the actual subset or sample used in the research study. Kumar *et al.* 2022:178) state that for qualitative research, a sample of 8-35 is sufficient for achieving data saturation.

3.5 Pilot study

Taherdoost (2021:10) states that a pilot study marks the beginning of research implementation. Dawson *et al.* (2014:118, as cited in Lingham 2011: 62) define pilot testing as a preliminary study that assesses the study's duration and cost—both actual and opportunity costs. In this study, a qualitative pre-test interview was conducted with selected individuals from the overall research population at the Durban University of Technology. A total of five interviews were conducted. These participants were excluded from the main research sample. The findings from the pilot study revealed the need to rephrase certain interview questions to enhance clarity for participants. Additionally, it was found necessary to include a few more questions, which were subsequently incorporated into the final research instrument.

3.6 Research instrument

Based on Arain *et al.* (2022:1789), the researcher created open-ended interview questions. Qualitative research uses open-ended enquiries. The interviews helped collect DUT MBA staff and student comments. Lingham (2011: 150) remarked that any study's participation rate may be poor despite the researcher's expectations. However, Welman (2019:44) posited that the participation rate can improve provided that the researcher is self-conducting the interviews with participants rather than just sending open-ended questions. However, due to geographical limitations to access

participants, some of the interviews were conducted via email. The interview schedule can be found in Appendices 5, 6, and 7.

People from the school, the administration, and students themselves took part in the semi-structured conversations. The researcher set up conversations in places that were handy for the people being interviewed, like their homes or schools. The participants are more comfortable when the talks take place in places, they are familiar with (Hossain, Alam, and Ali 2024:5). There were a set number of questions (see Appendices 5, 6, and 7) that were meant to find out what the participants thought about how load shedding affected the DUT MBA program.

3.6.1 Data collection procedure

The The data collection procedure in this study followed a structured and ethically sound process, beginning with the researcher obtaining formal permission from the Faculty of Management Sciences at the Durban University of Technology (DUT). The research proposal and ethical clearance were submitted for institutional approval. After permission, the researcher worked with faculty members to negotiate study dates that didn't conflict with the academic calendar or evaluations. These preliminary plans were necessary to develop a research timeline that accommodated staff and student availability.

Purposive sampling was then used to identify MBA students and academic staff. Dang, Van Nguyen, and Tran (2024:41) say purposive sampling is an effective qualitative research method that selects participants depending on research goals. Official university channels including institutional email and program managers sent participation invitations. A consent form and information sheet about the study's goal, ethics, and data processing were included in the invitation. Participation was voluntary, and no incentives were offered, in line with ethical standards and to avoid coercion, which aligns with the recommendations of Bell, Bryman, and Harley (2022:1).

After participants had reviewed the information sheet and submitted their signed consent forms, individual interviews were scheduled. The dates and times were arranged in consultation with participants to ensure convenience and maximise participation. Interviews were conducted in quiet and private settings within the university premises, although for participants with scheduling constraints, virtual interviews via Microsoft Teams were also arranged. Hossain, Alam, and Ali (2024:5)

note that flexibility in interview modalities enhances participant comfort and supports the achievement of data saturation. Each interview session was audio-recorded with prior consent, and detailed field notes were also maintained by the researcher.

Once data collection was complete, the interviews were transcribed verbatim. The transcription process allowed for the retention of linguistic nuances and contextual depth, which are critical for robust qualitative analysis (Proctor 2024:1). Before the research began, the transcripts were checked to make sure they were correct. According to Reyes, Bogumil, and Welch (2021:89), using tools like living codebooks to record the whole process of working with qualitative data makes the study more open and trustworthy. Following this advice, the researcher kept a digital record of all the choices and codes that came up during the analysis phase.

The interview data were analysed using the principles set out in Naeem, Ozuem, Howell, and Ranfagni (2024:23). This was the last step in the data collection process. This meant finding themes that came up repeatedly and putting the participants' answers into groups based on patterns that showed how they answered the main study questions. After that, the results were put together and added to the study's overall story. This strict and clear process made sure that the data gathered was not only rich and relevant to the situation but also handled in a responsible way and could be analysed well.

3.7 Data analysis

This study used a systematic and rigorous approach to analyse qualitative data to find patterns, relationships, and themes that answered the research question: How does load shedding affect MBA students' learning at a selected South African University of Technology? An inductive theme analysis was used, following Braun and Clarke's concepts and Bell, Bryman, and Harley's (2022:1) qualitative best practices.

The researcher read and reread all interview transcripts to begin data analysis. The participants' narratives were fully understood at this level. Each transcript was uploaded into NVivo to organise, code, and retrieve study-related text parts. Proctor (2024:1) states that NVivo promotes transparency and uniform coding in complex data sets. The first cycle of analysis highlighted and coded important words, phrases, and expressions using open coding. After that, axial coding grouped similar codes into themes that reflected participants' common experiences. Inductively developing these

themes allowed the data to speak for itself, following Pham (2024:55) and Dang, Van Nguyen, and Tran (2024:41).

The researcher was crucial in understanding participants' comments and tying emergent themes to the study's conceptual framework. Thematic analysis in qualitative research involves interpretive sensitivity and reflexivity. According to Fife and Gossner (2024:23), researchers must constantly analyse and develop new ideas in respect to data and study context. This study interpreted themes by iteratively comparing MBA personnel and students to detect convergence or divergence in perspectives. The researcher used NVivo to efficiently manage this enormous volume of qualitative data and trace raw data to final themes. The NVivo digital coding log was a “living codebook” (Bogumil and Welch, 2021:89), capturing analytical judgements and supporting the study's audit trail.

Themes were developed until data saturation, when no new codes or insights from interviewees emerged. This is essential for qualitative credibility and meets Naeem, Ozuem, Howell, and Ranfagni (2024:23) saturation requirements. This method yielded themes related to the study's sub-questions, such as students' impressions of learning disturbance, digital resource access issues, and load shedding's logistical effects on MBA programme delivery. This organised and transparent analysis procedure ensured that the findings were founded in participants' lived experiences and directly addressed the research objectives, boosting the study's credibility and relevance.

3.8 Validity and reliability

When it comes to qualitative research, validity is how well the study's results match up with the thing that was being studied. A number of methods were used to make sure the validity of this study. These included triangulating the data, checking with members, and reading relevant literature while interpreting the data. Bell, Bryman, and Harley (2022:1) say that interpretive validity means making sure that the researcher's analysis accurately captures the meanings and feelings of the participants. The expert used data triangulation, which means using information from more than one source, to improve the reliability of the interpretation. This meant getting information from both teachers and students, so the researcher could compare points of view from various participant groups and settings. Mannheimer (2024:25) also says that this kind of correlation is necessary to make sure that data is reliable.

As an extra step, member checking was done by showing early readings of the interview data to some participants. Having this chance to check or explain their answers lowers the chance that they were given false information. Pham (2024:55) says that member validation not only improves the accuracy of data interpretation but also makes participants feel like they own the results of the study. Peer debriefing was also done with the help of academic supervisors and colleagues who looked over the coding scheme and emerging themes with a critical eye. According to Bogumil, and Welch (2021:89), this practice helps make thematic groups more precise and checks for researcher bias, which strengthens the study's internal validity.

In qualitative study, reliability means how consistent and well-known the data is, as well as how the data was collected and analysed. A structured interview guide was used in this study to make sure that all subjects were asked the same open-ended questions in the same way. This increased the reliability of the data. Using NVivo software, the researcher also kept a digital audit path that showed every step of the coding and analysis process. Modugno (2024:8) says that clear documentation of analytical procedures makes qualitative results more reliable and easier to repeat. Also, the transcripts were compared to the original audio files to make sure they were correct, and the coding process was looked over several times to make sure that theme identification was consistent.

It is usually only used in quantitative studies to do test-retest procedures, but this qualitative study stuck to a systematic and repeatable analytic framework to keep the concept of dependability. In his work from 2024, Hameed stresses that this kind of dependability in qualitative research is not gained through statistical methods, but through openness, consistency in how data is handled, and active engagement with the data. These steps made sure that the results were based on the real-life experiences of the subjects and that they could be tracked and confirmed during the analysis process.

3.9 Trustworthiness

The trustworthiness of a study is` achieved by ensuring credibility, transferability, dependability, conformability, and authenticity (Naeem *et al.* 2024:23). The researcher ensured trustworthiness by applying the following:

- **Credibility**

  Results are credible if they resemble reality and are reasonable and trustworthy (McMillan and Schumacher 2014:5). Early acquaintance with participants, purposeful selection, comprehensive data collecting, and triangulation boost credibility (Nieuwenhuis 2021:22). To establish authenticity, the researcher interviewed staff and students to discover how load shedding affects the DUT MBA program. These interviews enabled the researcher to assess believability by describing setting-derived data in detail.

- To ensure participants felt comfortable with the researcher and answered questions honestly, the researcher built connections with them throughout data collection. When interviewees didn't grasp questions, the researcher clarified. This was to show that the study was done to appropriately identify and explain the data (Schurink, Fouché, and De Vos 2011:397).

- **Transferability**

  Maluleke (2019:13) defines transferability as the extent to which qualitative research findings may be applied elsewhere. Qualitatively, transferability is the generalizer's obligation. The research study was limited to one HEI program and had a small sample size, thus it is hard to anticipate if the findings and conclusions would apply to other scenarios.

- **Dependability**

  There is proof of dependability in the study plan and how it was carried out. When a researcher starts a study, they may change the research plan they originally choose since they can use new data sources and data-gathering methods (Nieuwenhuis 2021:22). Shenton (2004:63) says that the results would have to be the same if the study was done again by a different researcher in the same setting with the same subjects and using the same methods. The expert made sure that the same methods were used so that the same results would be found. As we already said, the researcher used talks with staff and students to find out how load sharing affects the DUT MBA program. This made sure that the results were accurate.

- **Confirmability**

  Shenton (2004:63) claims that guaranteeing true impartiality is challenging as exams and questionnaires are created by people and researcher infiltration of their prejudices is unavoidable. The researcher remembered throughout the data collecting procedure that personal attitude and emotions might influence not only the subjects but also the researcher. Examining personal beliefs and attitudes helped the researcher ascertain how they will affect the study. The researcher spent more time with the subjects and was able to build a strong rapport with them, therefore augmenting the strictness of research. The researcher made sure that the participants' thoughts and experiences shaped the study results rather than his own tastes.

3.10 Ethical considerations

A letter of permission was sent out before the major study and the test study. Researchers were able to make sure that the information subjects gave them would be kept private with the help of letters of information and permission. People who did not want to take part in the study could also choose not to. People who answered the survey were not forced to answer any question they did not want to. For five years, data is kept in a safe place. After that, all written data is burnt. Electronic records will be kept for five years and then thrown away.

3.11 Conclusion

This part addressed about the steps that were taken to make sure that the study's goal of finding out how load sharing affects teaching and learning in higher education places of higher learning was met. It was talked about the research population and sample strategy, the tools used to collect data, the ways that the data were analysed, their validity, dependability, trustworthiness, the study's limits, and ethical concerns. People from the MBA school at the faculty of management sciences, Durban University of Technology, made up the group of the poll. The next part will talk about the findings.

CHAPTER 4: DATA ANALYSIS AND DISCUSSION

4.1 Introduction

Chapter 4 examines how load shedding affects MBA students at a South African university of technology. In the data arises from the real-world experiences of load shedding victims. The chapter opens with a demographic review of participants to set the stage for the analysis. Following this, key themes, and sub-themes are detailed, offering a rich, nuanced knowledge of load shedding's multidimensional influence.

4.2 Demographics of the participants

The sample included 17 MBA students and 7 academic staff from DUT. Students formed the majority, which ensured that the findings strongly reflected the perspectives of those directly affected in the learning process. The inclusion of academic staff added depth, as these individuals are responsible for teaching, curriculum development, assessment administration, and general academic support, all of which are disrupted by power outages. Pham (2024:55) argued that the insights of academic staff are vital in generating a balanced and institutional-level understanding of educational disruptions. Administrative professionals also contributed essential perspectives, given their roles in managing resources and operational functions within the university. According to Bogumil and Welch (2021:89), administrative professionals are pivotal in developing institutional strategies for responding to system-wide crises such as load shedding.

Moreover, the study focused primarily on student experiences, given that students are the main beneficiaries of educational services. The variance in student experiences during load shedding provided valuable insights into resilience, adaptation, and resource disparities. Al-Bahou *et al.* (2023:311) underscore the importance of understanding student coping mechanisms to inform institutional support systems. Thus, the demographic distribution ensured a well-rounded analysis of how load shedding disrupts both the academic and administrative operations of the university.

4.3 Thematic mapping

The impacts of load shedding on MBA students' learning at a South African university of technology have been analysed to develop key themes and sub-themes, revealing load shedding's complex effects *on* academic life. The emerging themes and subthemes are outlined in Table 4.1.

Table 4.1: Thematic table

Major Themes	Sub-Themes
1. Frequency and duration of Load shedding	1. Daily occurrences, 2. Multiple sessions per day 3. Extended durations 4. Variability by location 5. Unpredictability
2. Perceptions of load shedding disruptions	1. Significant Academic Hindrance 2. Increased Academic Stress 3. Adjustment and Rescheduling Challenges, 4. Psychological Impact 5. Institutional Response and Limitations
3. Impact on Access to Electronic Resources	1. Interrupted Online Learning 2. Network Connectivity Issues 3. Adaptation Strategies 4. Disparities in Impact 5. Technological Solutions

The emerging themes and subthemes are discussed below. The development of themes followed recurrences of arguments and patterns of meanings.

4.4 Major Theme 1: Frequency and duration of load shedding

4.4.1 Sub-theme 1: Daily occurrences

The participants affirmed that the selected HEI has daily load shedding. This frequent interruption substantially impacts day and evening sessions and study time. Students struggle to maintain an academic schedule due to daily load shedding. The participants affirmed that these unplanned and persistent interruptions waste instructional time and impede students' ability to complete homework and prepare for assessments.

Excerpts from participant interviews:

> *Load shedding happens every single day, and it's really disruptive. We can't plan our study schedules properly since we never know when the power will go out.* (Participant S1)

> *I've had to reschedule so many classes since of daily load shedding. It's impossible to keep a consistent teaching schedule.* (Participant AC3)

Evening study sessions are the worst affected. Just when we get into the flow of studying, the power goes out, and it becomes impossible to continue. (Participant S8)

Daily load shedding means we constantly have to adjust our routines. It's very stressful and affects our ability to concentrate. (Participant S12)

Every day, there's at least one or two hours of power outage. It's very disruptive, especially during peak study times. (Participant S15)

The elicited findings indicated that the widespread load shedding is hurting academics. The participants said that power disruptions disrupted their study routines and prevented them from planning. This regular disturbance requires students and staff to change their habits, increasing stress and decreasing productivity. Rearranging classes and study times interrupts learning and decreases performance. Participants stated that this uncertainty makes students and staff anxious and irritable, which has a major psychological impact.

The findings are supported by Barella *et al.* (2024:281) who noted that frequent power outages interrupt teaching and upset students and teachers, reducing education quality. Crow (2024:65) found that lengthy power outages impair morale and productivity, highlighting the psychological effect. Daily load shedding at the selected HEI validates these findings, showing how widespread and different academic disruptions are, thus, showing that loadshedding frequently disrupts teaching and learning.

4.4.2 Sub-theme 2: Multiple sessions per day

Most participants affirmed that students undergo load shedding regularly. Daily power interruptions hurt their academic tasks. Multiple load shedding periods make it harder for students to manage time and finish studies. Users struggle to access electronic resources and online learning platforms during power outages.

Excerpts from participant interviews:

We often have load shedding two to three times a day. It's impossible to keep up with our coursework and online lectures. (Participant S2)

Multiple power cuts in a day are the norm. It disrupts everything, from lectures to study sessions and even exams. (Participant S5)

Sometimes we experience load shedding in the morning, afternoon, and evening. It's like we're constantly battling against the clock to get our work done. (Participant S9)

With load shedding happening so frequently, it's hard to find a continuous stretch of time to focus on studying or completing assignments. (Participant AC4)

The frequent interruptions make it difficult to maintain any sort of academic routine. We're always on edge, waiting for the next power cut. (Participant S11)

The responses demonstrate how everyday load shedding creates problems. Power outages hindered coursework and online courses, participants said. Lack of study time disrupts learning and promotes tension and frustration. Power outages prevent students from making a daily academic routine, slowing their development. The continual disruption harms academic performance and student and worker well-being.

The findings corroborate research on how frequent power outages influence academic performance. Kamolov and Tarazevich (2023:403) say that several daily power outages harm educational achievement. Multiple power interruptions lead students to postpone courses and study sessions, disturbing learning and focus. Such disruptions increase anxiety and morale, lowering academic productivity and well-being, according to Kawar *et al.* (2024:338).

Research shows that daily power disruptions make studying unpleasant, and it is hard to concentrate. Digital resources and online learning need steady energy, explain Kawar *et al.* (2024:338). Daily load shedding weakens instructional approaches, reducing academic progress and enjoyment. To handle power outages and offer a steady learning environment, Sardana *et al.* (2023:65) recommends long-term infrastructure investments in renewable energy and smart grid technologies. Daily load shedding impacts the selected HEI students' schedules. Multiple daily power outages distract students, hurting their academic work and health. The findings highlight the necessity for comprehensive solutions to frequent power outages and reliable education electricity.

4.4.3 Sub-theme 3: Extended durations

The load shedding at the selected university of technology was reported by the participants to last 2–4 hours. In this regard, long academic absences hinder student

learning. Long power outages hinder internet, virtual courses, and study. Load shedding constantly strips youngsters of electricity, worsening the issue.

Excerpts from participant interviews:

> *Each load shedding session lasts for about two to four hours. It's a huge chunk of time that we lose every day.* (Participant S3)
>
> *The long durations of load shedding are very disruptive. It's not just a quick power cut; it's hours of downtime that we can't afford.* (Participant S6)
>
> *When the power goes out for four hours at a time, it's impossible to keep up with our studies. We miss out on so much instructional time.* (Participant AC2)
>
> *Extended power cuts mean we can't access any of our online materials or complete assignments on time. It's very frustrating.* (Participant S10)
>
> *The lengthy durations of load shedding disrupt our entire day. It's hard to find enough time to focus on our studies with such long power outages.* (Participant S13)

Extensive load shedding affects students' academic performance. Participants stressed how long power interruptions hamper academic work. Long power outages waste instructional time and prevent students from accessing internet resources, doing homework tougher to complete. Load shedding causes youngsters to lose electricity many times a day, aggravating the issue. Students struggle academically in this unpleasant and inefficient learning environment.

Academic work is affected by lengthy power disruptions, according to research. Long power interruptions hinder learning and waste time, according to Nowlin and Wehde (2024). Failure to concentrate on academic work for long periods impairs study habits and academic achievement. Sardana *et al.* (2023:65) says extended power outages stress students and staff, hurting productivity and morale.

Evidence suggests long-term load shedding hurts teaching and learning. Digital resources and online learning systems need reliable electricity, according to Brahimi and Leperlier (2023:100). Long load shedding sessions limit these instructional tools' effectiveness, reducing academic performance and satisfaction. Sun and Ye (2024:3709) recommend long-term infrastructure investments in renewable energy

and smart grid technology to address power disruptions and stabilise learning environments.

Against that background, load shedding at the selected HEI hinders learning and academic activity. Students struggle to accomplish schoolwork, use the internet, and attend virtual classes during long power outages. The findings show the urgent need for comprehensive solutions to long power outages and a reliable education power supply.

4.4.4 Sub-theme 4: Variability by location

The participants established that load shedding frequency and duration vary by university location. Power outages effect academic activity differently in different buildings and periods. University workers and students deal with irregular power supply. Different load shedding timings disrupt academic planning and implementation, thus disrupting learning.

Excerpts from participant interviews:

> *The frequency and duration of load shedding vary a lot by location. Some buildings have more frequent and longer outages than others.* (Participant S4)
>
> *It's really frustrating since the power goes out at different times in different parts of the campus. We never know when or where it will happen next.* (Participant AC1)
>
> *The variability in load shedding schedules makes it hard to plan anything. One part of the campus might have power, while another is in the dark.* (Participant S7)
>
> *We have to keep moving around to find places with power. It's very disruptive and wastes a lot of time*. (Participant S11)
>
> *The inconsistent power supply across the campus makes it difficult to maintain a stable study routine. We're constantly adjusting to different load shedding schedules.* (Participant S14)

The comments show how variation in load shedding schedules throughout the institution causes problems. Participants often complained about power outages hindering academic preparation and execution. Moving across campus to obtain electricity consumes time and disturbs study. Different load shedding patterns affect academic activities differently, making it hard for students and staff to study

consistently. Variability increases university stress and dissatisfaction, reducing academic output.

The results match studies on how power outages affect academic pursuits. Rajagukguk *et al.* (2024:46) note that load shedding schedule fluctuations hamper academic work planning and execution, increasing stress and decreasing productivity. Moving around to obtain power disturbs learning and loses time. According to Rendón and Martínez (2024:1), the unstable power supply makes learning chaotic and reduces morale and academic performance.

The evidence implies that load shedding unpredictability hinders teaching and learning. A consistent power source is vital for preserving educational standards and successful academic procedures, according to Winardi *et al.* (2024:38). Load shedding schedules disrupt this steadiness, making academic quality difficult to sustain. To fix the core reasons of intermittent power supply and provide a stable learning environment, Yakobi and Yakobi (2024:1) recommend long-term infrastructure investments in renewable energy and smart grid technology.

Load shedding schedules vary throughout the selected HEI, causing academic issues. The fluctuating power supply affects academic planning and implementation, affecting learning unevenly. Moving across campus to obtain electricity consumes time and disturbs teaching and learning. The results show the urgent need for comprehensive solutions to solve irregular power supply and offer a stable and dependable power supply for education.

4.4.5 Sub-theme 5: Unpredictability

The participants' responses show that the selected HEI's uneven load shedding schedule makes academic planning difficult for students. Since students cannot predict when the next power loss will occur, power failures impede teaching and learning. Students must continually change their schedules and routines to meet the unreliable power supply, which is difficult. The absence of a regular load shedding timetable stresses and frustrates students and staff, reducing academic output.

Excerpts from participant interviews:

> *The load shedding schedule is very unpredictable. We never know when the power will go out, so it's hard to plan anything.* (Participant S5)

The inconsistency in the load shedding schedule makes it impossible to stick to a study routine. We're always on edge, waiting for the next power cut. (Participant AC3)

It's very frustrating since we can't predict when the power will be out. It disrupts everything, from lectures to study sessions. (Participant S8)

The unpredictability of load shedding means we have to constantly adjust our schedules. It's very stressful and affects our ability to concentrate. (Participant S10)

Without a reliable schedule, it's hard to plan our academic activities. The uncertainty creates a lot of anxiety and frustration. (Participant S12)

Student replies show how unexpected load shedding affects schoolwork. Varying power makes study scheduling difficult. Fear of power disruptions makes learning unpleasant and ineffective. Lack of a load shedding timetable prohibits students from organising academic activities, extending power outages. Ambiguity makes students and professionals anxious and frustrated, lowering intellectual output. The study examined how sudden power interruptions affect academics. According to Yende (2024:11), load shedding schedules stress and lower productivity in education. Unreliable electricity causes chaos and unpredictability in the classroom, making academic preparation impossible. Power outages reduce academic performance by raising anxiety and morale, according to (Khoza 2024:345).

Unpredictable load shedding affects teaching and learning, according to research. Malik *et al.* (2022:1165) advocate a consistent power supply schedule to maintain academic standards. Academic quality is threatened by load shedding's unpredictable schedule. Manamperi *et al.* (2023:1) suggest long-term infrastructure investments in renewable energy and smart grid technologies to prevent power outages and provide a stable learning environment.

By and large, the selected HEI's uneven load shedding schedule hinders student preparation. Thus, since students cannot predict the next power outage, power supply variability makes learning difficult and unproductive. The results show that comprehensive solutions to unforeseen power interruptions and a consistent and dependable power supply for education are needed now.

4.5 Major theme 2: Perceptions of load shedding disruptions

4.5.1 Sub-theme 1: Significant academic hindrance

The findings of the study show that MBA students at the chosen HEI consider load shedding to be a major academic obstacle. Students said power interruptions disturb their study schedules, limit internet options, and lower education quality. In this regard, load shedding encourages students to abandon their studies and find ineffective coping mechanisms. Missing lectures hinders exam preparation, assignment completion, and group project participation.

Excerpts from participant interviews:

> *Load shedding has significantly disrupted my study routine. I find it challenging to keep up with my coursework when power outages occur unpredictably.* (Participant S1)
>
> *The quality of my education has been compromised due to frequent load shedding. I miss out on crucial lecture content and have to struggle to catch up.* (Participant S3)
>
> *It is very frustrating when I cannot access online resources or submit assignments on time since of power outages.* (Participant S7)
>
> *Load shedding has forced me to change my study schedule multiple times, which affects my productivity and learning outcomes.* (Participant S10)
>
> *The constant power cuts make it impossible to plan my academic activities effectively, leading to a significant decline in my performance.* (Participant S12)

Respondents said load shedding harms academics. Students hate power interruptions that disrupt learning. Missed lectures and internet issues impair education quality. Adjusting to power disruptions affects productivity and learning. Students' difficulties to complete homework and meet deadlines demonstrate the need for reliable electricity.

According to Alkaldy, Albaqir and Hejazi (2019:149), frequent power outages impede course completion and worry students and instructors. (Akram 2022:1) note that frequent power outages disrupt schooling, making it challenging for students to maintain routines and perform successfully. Alkaldy, Albaqir and Hejazi (2019:149) say that inconsistent power raises anxiety and reduces academic performance. These studies support students' experiences at the selected HEI, agreeing that load shedding

hurts academic performance. Educational institutions need extensive load shedding solutions, according to statistics and literature. Renewable energy and reliable backup power solutions are needed to avoid power outages and provide a stable learning environment.

4.5.2 Sub-theme 2: Increased academic stress

The participants revealed that load shedding significantly increases MBA students' academic stress. Power outages are unpredictable, so students worry about homework, online classes, and deadlines. The stress hinders academic performance and well-being. Studying due to the possibility of a power outage is poor for learning and time management.

Excerpts from participant interviews:

> *The unpredictability of load shedding creates a lot of anxiety. I'm always on edge, wondering if I'll be able to finish my assignments on time.* (Participant S2)
>
> *Load shedding has increased my stress levels significantly. It's hard to focus on studying when you're constantly worried about the power going out.* (Participant S5)
>
> *The constant uncertainty makes it difficult to plan my studies, leading to increased stress and reduced productivity. (Participant S8)*
>
> *I feel a lot more anxious about my academic performance since of the frequent power outages.* (Participant S11)
>
> *The stress caused by load shedding is overwhelming. It affects my ability to concentrate and perform well in my studies.* (Participant S14)

Student comments reveal nervousness due to load shedding's unpredictability. Unpredictability impairs academic planning and administration. Stress reduces attention and productivity. The fear of not completing tasks on time and continual study schedule disruptions stress students, harming their academic performance and well-being.

The findings echoed the studies that revealed students have increased academic stress. Elom *et al.* (2024:1) state that the unpredictability of power outages causes anxiety and lowers academic production and morale. Yakobi and Yakobi (2024:1) remark that frequent power disruptions alert students, increasing stress. Since

frequent disruptions hinder student focus and performance, Yende (2024:11) emphasises the need for a steady power supply for an effective learning environment.

4.5.3 Sub-theme 3: Adjustment and rescheduling challenges

The majority of the participants pointed out that load shedding needs frequent academic changes and rescheduling. Students and teachers must alter their schedules during power outages, postponing and rushing academic work. Classes, assignments, and examinations are continuously rescheduled, disrupting learning. Intrusions delay courses and affect learning.

Excerpts from participant interviews:

> *We constantly have to reschedule classes and deadlines since of load shedding, which disrupts the academic flow.* (Participant S3)
>
> *It's challenging to stick to a study plan when we have to keep adjusting our schedules due to power outages.* (Participant S6)
>
> *Load shedding forces us to rush through assignments and exams, compromising the quality of our work.* (Participant S9)
>
> *The frequent need to reschedule academic activities is very frustrating and affects our learning experience.* (Participant S12)
>
> *Adjusting to load shedding schedules is exhausting. It feels like we're always playing catch-up.* (Participant S15)

These excerpts demonstrate how load shedding makes academic scheduling difficult. The constant change disrupts academic routines, slowing and hurrying work. Students complain about not studying, which hurts their job and learning. The continual rescheduling of sessions and deadlines disturbs teaching and learning, making academic life difficult.

The findings mirror other academic scheduling load shedding studies. Power interruptions need frequent academic rescheduling, according to Muftić *et al.* (2023:606). Slowing course completion and rushing academic work lowers education quality. Muftić *et al.* (2023:606) emphasise the need for a reliable power source in maintaining an academic schedule since frequent disruptions disrupt learning. Rajagukguk *et al.* (2024:46) also remark that frequent rescheduling and power

outages increase stress and impair productivity, hurting academic performance. Data obtained in the current study matches previous research, stressing the need for reliable power in schools. Backup power systems and load shedding may reduce power outages and enhance academic organisation.

4.5.4 Sub-theme 4: Psychological impact

From the views and perceptions of the participants, it was noted that load shedding affects MBA students mentally. Student morale and productivity suffer from frequent power disruptions. Load shedding disrupts electricity, frustrating students. Psychological distress hinders academic success and well-being.

Excerpts from participant interviews:

> *The constant disruptions from load shedding are very demoralising. It's hard to stay motivated when you're always dealing with power cuts.* (Participant S4)
>
> *I feel a lot more stressed and anxious since of the frequent power outages. It's affecting my mental health.* (Participant S7)
>
> *Load shedding makes me feel helpless and frustrated. It's hard to concentrate on my studies when I'm always worried about the power going out.* (Participant S10)
>
> *The psychological impact of load shedding is significant. It's very challenging to stay productive and positive when you're constantly dealing with disruptions.* (Participant S13)
>
> *I've noticed a decline in my mental health and academic performance due to the continuous power outages.* (Participant S16)

It seems that load shedding affects students' cognition. Disruptions cause stress, worry, and powerlessness among students. This mental strain decreases productivity, morale, and academic motivation. Power interruptions make learning unpleasant and unpredictable, exacerbating students' issues.

The results in this study match power outage psychological literature. Rendón and Martínez (2024:1) describe how frequent power outages cause stress and lower productivity. Continuous interruptions may demotivate and degrade students' academic performance. Power outages stress and demoralise students, hence Winardi *et al.* (2024:38) underscore the necessity of a steady and dependable power

supply. Alkaldy, Albaqir and Hejazi (2019:149) also note that power interruptions increase stress and lower academic output by keeping students and staff on alert.

The findings concur with previous studies' findings that load shedding has a psychological effect and must be addressed. A reliable backup power arrangement and clear load shedding schedules may minimise anxiety and provide a more predictable academic atmosphere, improving students' well-being and academic achievement.

4.5.5 Sub-theme 5: Institutional response and limitations

The findings from the participants reflected differing perspectives on university load shedding reduction efforts. Students believe the school rectified the problem by postponing lessons and providing backup power. Poor measurements and treatment leave some feeling unsupported. Mixed responses suggest students require more frequent power outage assistance.

Excerpts from participant interviews:

> *The university has made some efforts to provide backup power and reschedule classes, but it's not enough. We still face a lot of disruptions.* (Participant S5)
>
> *I feel that the university could do more to support us during load shedding. The measures they've put in place are insufficient.* (Participant S8)
>
> *There are some backup power solutions, but they are not always reliable. We need more comprehensive measures to deal with load shedding.* (Participant S11)
>
> *The university has tried to address the issue, but the support is still lacking. We need better solutions to minimise the impact of load shedding.* (Participant S14)
>
> *I don't feel supported by the university during load shedding. The measures in place are inadequate and do not address the root of the problem.* (Participant S17)

Many students dislike school load shedding. Great backup power and class rescheduling don't fix power outages. Students need greater load shedding academic assistance since they feel unsupported and dissatisfied without solutions. University load shedding is seen with mixed opinions, matching crisis support literature. According to Elom *et al.* (2024:1), institutional support is necessary to minimise academic interruptions from power outages. Comprehensive approaches need

reliable backup power and clear load shedding timings to aid students and avoid disruptions. Khoza (2024:345) highlights proactive actions to overcome frequent power interruptions, whereas Malik *et al.* (2022:1165) emphasise considerable infrastructure changes to provide a stable learning environment. The data and studies reveal the institution must increase load shedding assistance. More reliable and broad backup power systems, improved power outage date information, and flexible academic standards may decrease load shedding and improve academic assistance.

4.6 Major theme 3: Impact on access to electronic resources

4.6.1 Sub-theme 1: Interrupted online learning

The participants highlighted that power outages substantially damage Durban University of Technology's online learning tools, according to semi-structured interviews. The interruptions hinder students' ability to utilise academically important communication tools, access digital course materials, and attend in-person lectures. Disruptions lead students to miss learning opportunities, interrupt study schedules, and feel anxious. Power interruptions disturb their education, making it hard to meet deadlines and perform well.

Excerpts from participant interviews:

> *Load shedding often interrupts my online lectures, making it hard to follow the course content and participate in discussions.* (Participant S1)
>
> *I have missed several important lectures and assignments since of load shedding. It's frustrating and affects my grades*. (Participant S2)
>
> *Power outages disrupt my study routine, and I struggle to catch up with the missed content later.* (Participant S3*)*
>
> *It's difficult to stay focused and motivated when you constantly worry about the next power outage during your study time.* (Participant S4)

Participant responses reveal load shedding negatively impairs online learning. Power outages inhibit students from attending live lectures, affecting learning and memory. Interruptions annoy and irritate students who struggle to study. The constant disruption undermines their academic performance, motivation, and learning. Catching up on missed information makes it hard for students to accomplish academic goals.

These findings support earlier studies on power interruptions and education. Load shedding lowers academic performance and stresses students in online learning, according to Manamperi *et al.* (2023:1). Lee (2021:11) states that power outages aggravate educational inequalities since digital learning tools need electricity. These studies complement data from the current study and demonstrate the need for sustained backup power to ensure educational resource availability. To reduce online learning disruptions, Adedoyin and Soykan (2020:863) suggest offering offline resources and finding alternative power sources.

4.6.2 Sub-theme 2: Network connectivity issues

The study findings established that load shedding hinders DUT MBA students' academic resource downloads and submissions. Due to unpredictable internet connections, power interruptions prevent students from using online platforms, researching resources, and submitting homework. Digital tool users are particularly frustrated since it hurts their grades. Frequent power outages and unreliable network connection impair academic achievement.

Excerpts from participant interviews:

> *During load shedding, the internet connection is either slow or completely unavailable, making it impossible to download course materials.* (Participant S5*)*
>
> *Uploading assignments on time becomes a major issue when the network is unstable due to power outages.* (Participant S6)
>
> *I often experience choppy internet during load shedding, which disrupts my online classes and group discussions.* (Participant S7)
>
> *The network issues during load shedding are a major obstacle to accessing the information I need for my research.* (Participant S8)

The above excerpt from participants emphasises the need for stable network connection during load shedding. Internet instability hinders students' ability to download materials, attend online courses, and complete homework. Delays and poor academic work result from this interruption. Slow or unstable internet connections worry students and hinder their academic performance. Interruptions influence their current academic duties, long-term learning results, and course participation.

The elicited findings are consistent with existing studies on network connection and education during power outages. Akram (2022:1) notes that power interruptions worsen connection issues and impair academic activity, making regular internet availability essential for online learning. The necessity of steady internet connectivity for online education and digital resource access. These findings show the larger effects of load shedding on network connection. The study suggests that robust internet infrastructure and alternative power sources may boost learning.

4.6.3 Sub-theme 3: Adaptation strategies

The participants pointed out that each DUT MBA student handles load shedding differently. Users may pre-download materials, utilise backup power, and adjust study schedules to load shedding. Students prepare for power outages to avoid school related interruptions. These methods demonstrate their will to survive power outages. These methods assist but do not always eradicate problems.

Excerpts from participant interviews:

> *I download all necessary materials in advance so that I can study offline during load shedding.* (Participant S9)
>
> *I try to find places with generators or backup power to continue my studies when there is no electricity at home.* (Participant S10)
>
> *Adjusting my study schedule to avoid load shedding times helps, but it's not always possible.* (Participant S11)
>
> *Using portable chargers and power banks is essential for keeping my devices running during power outages.* (Participant S12)

Participant remarks show intentional load shedding. Downloading materials and utilising backup power keep students on track. However, these alternatives need substantial planning and flexibility, which few students can afford. Adjusting study programmes for load shedding is challenging, especially during unexpected power outages. Portable chargers and power banks are handy but restrict ways to access digital resources. These adaptive techniques reduce power outages but do not address the issue.

DUT MBA students' adaptation skills match power outage coping literature. Ally (2008:15) suggests offering offline instructional materials to alleviate power outages. Alkaldy, Albaqir and Hejazi (2019:149) emphasise the need for flexible scheduling and time management for academic output under unexpected interruptions. These tactics match DUT MBA students' proactive approach. The research also stresses the need for systemic solutions, such as investing in dependable backup power systems and improving infrastructure resilience, to assure continued access to educational resources and academic performance (Winardi *et al.* 2024:38).

4.6.4 Sub-theme 4: Disparities in impact

Many of the participants highlighted that some students cope better with load shedding owing to other power sources. These discrepancies show how students handle power interruptions differently. Students with generators, power banks, or backup power can better manage their academics. Load shedding makes it harder for poorer students to study, worsening educational inequity.

Excerpts from participant interviews:

> *Having a generator at home makes a huge difference in managing my studies during load shedding.* (Participant S13)
>
> *I rely on power banks to keep my devices running, but not everyone can afford them.* (Participant S14)
>
> *Students who can afford alternative power sources definitely have an advantage.* (Participant S15)
>
> *It's much harder for those of us who don't have access to backup power or reliable internet during outages.* (Participant S16)

The excerpts show that students with alternative power sources handle load shedding better. A generator or power bank lets some students study and access digital resources without interruption. Some students who cannot afford these options struggle harder to study. This disparity emphasises the need for structural solutions to provide all students with reliable energy and internet connection, regardless of poverty.

Educational inequality studies show load shedding differences. Load shedding increases educational inequality, especially for poor students, writes Yende (2024:11).

Yakobi and Yakobi (2024:1) emphasise fair access to alternate electricity to provide uninterrupted schooling for all students. The literature recommends policy and infrastructure reforms to reduce these inequities and establish a more equitable education system. Improving internet and backup power may help schools provide all students with equal academic chances.

4.6.5 Sub-theme 5: Technological solutions

The participants propose load shedding electronic resource access systems. In this regard, they must provide offline access to resources, invest in generators and solar panels, and upgrade the university's internet infrastructure to cope with load shedding. The suggestions imply structural adjustments for managing frequent power outages. These technology solutions may reduce load shedding's influence on academics and improve learning.

Excerpts from participant interviews:

> *Providing offline access to course materials would be a huge help during load shedding.* (Participant S17)
>
> *Investing in solar panels or other sustainable energy sources could provide a more reliable power supply.* (Participant S18*)*
>
> *The university should enhance its internet infrastructure to ensure stable connectivity even during power outages.* (Participant S19)
>
> *Backup generators in key buildings would help maintain access to essential resources during load shedding.* (Participant S20)

Participants suggested realistic and sustainable ways to reduce load shedding's effect on academics. Study amid power interruptions using offline course materials. Over time, solar panels reduce power outages and grid dependence. Providing university internet during power outages addresses a major student issue. Backup generators in critical buildings allow academic and administrative work to continue. These technologies reduce load shedding and improve education.

The literature on power outages and education echo DUT MBA students' technological solutions. Yende (2024:11) emphasises the need for backup power systems and renewable energy for educational continuity. To maintain academic production during

power outages, Manamperi *et al.* (2023:1) suggest offline educational resources. For online learning and communication during power outages, Winardi *et al.* (2024:38) advocate a solid internet infrastructure. These results confirm the students' ideas and stress the need for comprehensive and sustainable load shedding solutions. These technologies may increase learning and power outage resilience in institutions.

4.7 Discussion of the findings

4.7.1 Frequency, duration, and unpredictability of load shedding

Frequency and length of load shedding at Durban University of Technology (DUT) impair academic and operational procedures. Most participants reported regular power interruptions lasting two to four hours, typically numerous times. Students struggled to study, finish homework, and prepare for exams due to these prolonged disruptions. Educators also complained about last-minute lecture cancellations. Muftić *et al.* (2023:606) found that power outages in academic institutions frequently shorten teaching hours and strain schedules, leading to truncated syllabi or hasty lecture delivery. Lab sessions, multimedia presentations, and interactive learning activities were often disrupted, reducing their educational value, lecturers said. Due to missing deadlines and lectures, students reported increased worry and irritation outside of class. Wireless services like digital libraries and course administration platforms were also affected by prolonged outages. Academic productivity and quality decline, especially for students with few home technology options.

Participants also complained that load shedding times are unpredictable, making planning difficult. Erratic outages catch staff and students off guard, often during key academic work, unlike routine disruptions that allow for preparation. This unpredictability puts students under pressure, lowering quality and stressing them out. Power outages hinder cognitive performance due to the psychological burden of not knowing when connectivity or electricity will return, according to Yende (2024:11). Several students said they avoided starting complicated work in anticipation of a power outage, which slowed academic progress and productivity. Generators in certain university buildings provide temporary relief, but they exclude off-campus students who are also affected. Rajagukguk *et al.* (2024:46) recommend better infrastructure, including distributed energy sources, to reduce load shedding's uneven effects on educational environments. Thus, academic institutions like DUT are subject to

systemic energy instability without a reliable electrical schedule or universal backup options.

4.7.2 Impact on academic and administrative activities

Load sharing has a direct and wide-ranging effect on the academic core of DUT. It changes how lectures are given, how students interact with technology, and how much they participate. Participants said that classes are often stopped in the middle of the session or cancelled altogether, especially ones that use technology like projectors, computers, or videoconferencing platforms. These interruptions not only make teaching less effective, but they also make both teachers and students less motivated. Rendón and Martínez (2024:1) say that when power is lost often in higher education, the program is broken up and students are less interested in learning. Some professors said they tried to help by offering pre-recorded lectures and materials that could be used at any time, but students' lack of internet or electricity at home often made these options less useful. Also, class talks, which are an important part of graduate programs like the MBA, are often put on hold, which makes it harder for people to share their knowledge and work together. When lectures went on during power outages, students said they couldn't fully join since the lighting wasn't good, their devices' batteries ran out, or the internet connection was slow. This makes the learning process less consistent and more broken up, which hurts both understanding and performance.

During times of load shedding, activities that aren't related to school also suffer a lot. Keeping records, processing exams, and talking between departments are all administrative jobs that depend on electronic systems working without any problems. Several respondents said that power outages often caused systems to shut down, delays in handling academic paperwork, and problems with how staff and students talked to each other. Khoza (2024:345) points out that systemic energy shortages can really hurt institutional operations that depend on digitalised administrative infrastructure. When the power goes out, departments can't get to centralised databases. This throws off the academic schedule and delays important tasks like graduation applications and financial aid payments. In the same way, internal communication tools and emails that depend on campus-wide servers are shut down, stopping the flow of important data. Malik *et al.* (2022:1165) also say that this disruption in communication lines makes things more confusing, hurts the efficiency

of institutions, and creates an environment where people can't trust the government. As a result, the school as a whole is seen as less attentive, which can make students less satisfied and trusting. These problems show how important it is to have strong backup plans, like decentralised power supplies and strong IT systems, so that operations can keep going even when load shedding happens often.

4.7.3 Academic productivity and psychological consequences

The effects of load shedding on academic production were complex. Participants blamed missed lectures, submission deadline delays, and attention issues for their performance drop. Students without backup power or off-grid learning locations lost many productive hours. Other participants noted adaptability. During outages, some students accessed alternative university facilities or devised flexible study schedules around load shedding. Akram (2022:1) agrees that educational disruptions can be frustrating, but institutional flexibility and personal resilience can help students succeed. However, such modifications require unequal access to facilities and resources. Thus, while some students adapted through institutional support and personal resourcefulness, others remained disadvantaged, indicating diversity in stress adaptation.

All individuals felt psychologically affected by load shedding, along with academic obstacles. During exams and assignment deadlines, students and instructors reported increased anxiety, tension, and decreased motivation. Unpredictable outages increased powerlessness, emotional weariness, and cognitive strain. These findings support Elom *et al.* (2024:1), who related power disruptions to academic exhaustion, emotional distress, and mental health decline. For many students, regular power outages felt like losing control over their academic journey, especially when deadlines approached. The uncertainty also eroded trust in the institution's assistance. Each power outage made students expect failure or unproductivity, lowering morale. Such psychological pressures affect academic achievement, student well-being, retention, and educational satisfaction over time. This emphasises the need for psychological and technical solutions.

4.7.4 Adaptive strategies and student innovation

Many DUT students were very creative in how they dealt with the problems that came up when the power went out often. Some strategies were to download learning

materials ahead of time, plan study lessons for times when there wasn't load shedding, and move to places with generators, like coffee shops or libraries. A lot of people who could afford them also used power banks and portable Wi-Fi hotspots. These changes show a strong dedication to doing well in school despite difficulties in the surroundings. But this endurance isn't spread out evenly. Students from low-income families had a bigger problem in school since they didn't have access to these kinds of tools. This is similar to what Sardana *et al.* (2023:65) say, who stress that unequal access to technology tools makes existing differences in education even worse in places with limited energy. These plans might help with short-term problems, but they don't fix the problems that are built into the school system's structure.

Since load shedding caused problems with operations, academic staff also had to make big changes. A lot of professors switched from teaching at the same time to teaching at different times, like using WhatsApp to share recorded lessons or voice notes. Even though these options weren't as interactive, they made sure that material was always delivered and lessened the need for real-time digital platforms. Some teachers also pushed back due dates for assignments or came up with other tests to help students who were hit by power outages. Manamperi *et al.* (2023:1) say that these kinds of varied teaching methods are necessary in unstable energy settings so that schools can protect students' learning. But using these unofficial tools, which are often not part of institutions' LMS systems, makes people worry about data protection, consistency of engagement, and quality assurance. Still, these methods show an important change in the way we teach—one that is more open to adaptability and taking into account the real world. Still, it's not clear if institutions are ready to make these flexible measures official and back them up within policy frameworks.

4.7.5 Institutional responses and infrastructure challenges

DUT has installed diesel generators in important buildings and adjusted submission policies during peak outages to avoid load shedding. These initiatives provided temporary relief, but participants worried about their unequal execution and restricted breadth. Many university regions lacked backup power, and off-campus students felt ostracised. Inconsistencies reduced intervention efficacy and increased perceptions of unfairness and neglect. Elom *et al.* (2024:1) believe that partial or inconsistent reactions to systemic disturbances reflect institutional inefficiencies and reduce stakeholder trust. The use of fossil-fuel generators is expensive and unsustainable,

raising concerns about their long-term viability. Generators symbolised a reactionary, not proactive, institutional posture for many.

Participants presented various innovative solutions to these issues. Solar energy initiatives, which generate clean, decentralised, and reliable electricity, were key. Improved campus-wide internet infrastructure was also suggested to maintain digital learning platforms during outages. Participants stressed the importance of load shedding schedule transparency for academic planning and preparation. These recommendations accord with Malik *et al.* (2022:1165) and Rajagukguk *et al.* (2024:46), who encourage universities integrate renewable energy and smart-grid technology. The solution goes beyond technological investments to governance structures that encourage accountability, equitable access, and transparent communication. The findings show that ad hoc solutions cannot address load shedding's structural hazard. Instead, universities must stress sustainability, accessibility, and academic continuity in infrastructural upgrades.

4.7.6 The need for integrated, long-term solutions

The results show that the effects of load shedding, which include everything from school delays and mental stress to inefficient institutions, should not be looked at separately. Instead, these problems are linked and build on top of each other in a cycle. For example, projects that are due late since of unreliable electricity cause stress while also putting too much pressure on administrative systems that can't handle all the rescheduling. Since of this, planning for institutions needs to be based on systems thought. Temporary fixes, like putting in generators or extending due dates, help right away, but they don't fix the problems with the way the learning setting is built. Winardi *et al.* (2024:38) say that long-term, integrated methods that deal with root causes instead of symptoms are what make schools resilient in places where there isn't enough energy. At DUT, this means coordinating the building of infrastructure, the rules for teachers, and the services that help students into a single framework that is energy-efficient and keeps the school running.

To make this happen, the school needs to adopt a model that looks to the future and is based on acceptance, empathy, and new ideas. In addition to technological solutions like solar panels, energy storage systems, and better broadband infrastructure, schools should have flexible rules that consider the different ways that

students can access power and technology. Also, psychoeducational support needs to be given top priority since ongoing changes have been shown to have negative effects on mental health. The culture of the institution should change to encourage teaching staff to be flexible and creative, and students should be given the chance to help make decisions about energy-related changes. Sardana *et al.* (2023:65) say that these kinds of reforms should be based on fairness, making sure that all students gain from better conditions instead of keeping social and economic differences. As much as it is about infrastructure, load shedding is a problem that needs to be solved by leaders who make sure that policies are consistent. Adopting an integrated approach will help DUT create a stronger educational ecosystem that can handle power outages and improve student health and participation in school.

4.8 Conclusion

Chapter 4 showed how load shedding affects MBA students at the selected HEI via data analysis. The study shows that load shedding has serious effects on students' academic schedules and learning. Students adapting to academic uncertainty miss lectures and tutorials and experience stress and anxiety.

The analysis found that widespread load shedding increases electronic resource access concerns. Students complain about frequent online learning platform stoppages, inadequate internet connection, and limited research and communication. Alternative power solution students face these challenges, which hinder academic progress and widen the gap.

Many students dislike the university's load shedding. Some students have the benefit of backup power and welcome flexible schedules, but the overall situation requires more comprehensive solutions. Interruptions upset students and lower morale, hampering DUT teaching.

Finally, load shedding's consequences on higher education need solutions. They should incorporate reliable backup power systems, better electronic resource access infrastructure, and student-friendly institutional policies. DUT can improve its learning environment and load shedding resilience by addressing these crucial challenges. This chapter lays the groundwork for academic continuity and student well-being.

CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

Chapter 5 synthesises the findings from the examination of data on load shedding's effect on MBA students' learning at a South African university of technology. Based on Chapter 4's theme analysis, this chapter summarises the results, draws significant inferences, and proposes concrete solutions to avoid negative outcomes. The study examines load shedding frequency, duration, student perceptions, and how these disruptions affect learning-critical electronic resources.

This chapter first reviews the data and discusses how load shedding impacts students' academic performance. After that, the conclusions will describe the findings and suggest next steps. Finally, the ideas section will provide ways to reinforce the educational environment against such interruptions, enabling students to achieve their academic goals despite power supply concerns.

5.2 Conclusions of the study

The primary goal of the study was to examine how load shedding affects MBA students at a South African university of technology. The conclusions are presented here according to how they address the research objectives.

5.2.1 Conclusions regarding Objective 1

The findings gathered from participants' responses clearly demonstrate that load shedding has a profound impact on the academic experience within the DUT MBA programme. This directly addresses the first research objective, which sought to explore the frequency and duration of load shedding during the academic year. Participants consistently reported that power outages occur almost daily and often last for extended periods, affecting both daytime and evening classes. These disruptions make it extremely difficult to maintain a consistent academic routine, leading to a loss of valuable teaching time and limiting students' ability to complete assignments or adequately prepare for assessments. Many participants expressed feelings of stress, frustration, and diminished productivity as a result. The unpredictability of the outages has, in many cases, negatively influenced their academic performance and overall learning experience.

In essence, the data collected strongly supports the conclusion that frequent and prolonged load shedding poses a serious challenge to academic continuity and success within the DUT MBA programme, thereby fulfilling the intended objective of this part of the study.

Multiple load shedding events every day make the problem even worse, making it harder for students to keep track of their time and finish their work. Participants stated that power outages make it harder to use electronic tools and online learning platforms, which makes schoolwork even more difficult. Interruptions occur relatively frequently, which makes learning less smooth and more stressful for both students and staff. The results are in line with other study that shows that frequent power outages hurt academic performance, morale, and productivity.

The problem is made worse by the fact that load shedding plans change and are hard to predict in different parts of the university. Participants said that the unstable power supply makes it hard to plan and carry out schoolwork, so students and staff have to change their habits all the time. This lack of predictability makes the learning setting unstable, which raises stress and lowers academic output. The study stresses how important it is to find complete answers to the problems caused by load shedding right away. For example, long-term investments in infrastructure for renewable energy and smart grid technologies could help make sure that schools always have power so they can keep doing their work.

5.2.2 Conclusions regarding Objective 2

Students' views on load shedding's effects on teaching and learning were examined. The MBA students' perceptions of load shedding at the selected HEI show that power interruptions impede academics. Power disruptions disrupt study schedules, limit internet access, and lower education quality, so students view load shedding as a serious academic obstacle. The frequent and unpredictable power cuts drive students to abandon their studies and use inefficient coping techniques, resulting in missed lectures, poor exam preparation, and trouble finishing assignments and group projects. Participants said load shedding hinders their academic schedule.

In addition, load shedding significantly raises academic stress among DUT MBA students. Power interruptions are unpredictable, so students worry about completing homework, attending online classes, and meeting deadlines. Due to frequent

interruptions, students struggle to focus and manage their time, which hurts their academic performance and well-being. The unpredictability about electricity supply increases stress, lowering productivity and student learning.

Load shedding requires regular academic activity modifications and rescheduling, making it harder for students and teachers to maintain a constant academic flow. Rescheduling classes, assignments, and exams frustrates students and lowers education quality. Participants said constant rescheduling and rushing through schoolwork hurt their studies. These findings highlight the critical need for comprehensive load shedding mitigation options, such as reliable backup power systems and proactive institutional actions to provide a steady and conducive learning environment.

5.2.3 Conclusions regarding Objective 3

The study looked at how much load shedding affects the MBA program's access to online lectures, research materials, and contact tools. The study looks at how load shedding affects access to electronic tools in the DUT MBA program and finds that it causes big problems for online learning. The people who took part said that power outages make it hard for them to follow online lectures, get to digital course materials, and communicate successfully. These interruptions cause students to miss out on learning chances, have trouble sticking to their study schedules, and feel more anxious. This makes it hard for students to meet goals and keep up with their schoolwork. The results make it clear that load shedding makes it harder for students to do their online learning and stress the importance of having dependable power solutions for school activities.

The study also discovered that load sharing makes it very hard for students to connect to the internet and download and turn in schoolwork. Students cannot use online platforms, do research, or turn in projects on time since their internet connections aren't reliable when the power goes out. Students get frustrated with this instability, which hurts their marks and academic success. The participants were worried about how hard it would be to keep up a regular and useful school schedule when the power and network would go out so often. These results show how important stable internet service is for getting to academic resources and learning online.

The participants also talked about different ways to adapt to lessen the effects of load shedding, such as downloading materials ahead of time, using backup power sources, and changing their study routines. Even though these tactics show how strong and determined the students are, they aren't always enough to get through power outages. The study showed that students' abilities to deal with load cutting were not all the same. Those who had access to other power sources did better than those who did not. This unfairness makes educational differences worse and highlights the need for structural solutions, like spending money on backup power systems and making the internet better. The study comes to the conclusion that complete technological solutions are needed to make sure that students can always access electronic tools and do well in school during load shedding.

5.3 Recommendations of the study

Integrating renewable energy systems, especially solar electricity, is crucial for reducing load shedding's educational impact on institutions. Solar PV panels and lithium-ion battery storage systems can power libraries, labs, and student dormitories. Phased implementation should start with high-use academic blocks and move to administrative and communal areas. Initial installation costs are projected at R5 million to R10 million per building, but long-term economic and environmental benefits including lower electricity bills and operational resilience surpass them. Solar integration boosts institutional autonomy and energy reliability, say Manamperi *et al.* (2023:1). This follows global higher education infrastructure trends towards green investments for long-term sustainability. To ease this transition and save capital costs, the institution could seek green energy assistance from national and international sources.

To maintain academic activity, the university needs invest in backup power with renewable energy. Hybrid diesel-electric generators with automatic switch-over systems and battery storage power vital operations during outages. UPS units should be installed in computer labs, server rooms, and administrative offices to prevent data loss and allow users to save or finish tasks before power loss. Diesel generators are ubiquitous, but the institution should switch to biodiesel or natural gas. Mthanti (2023:161) notes that diesel generators are efficient but pollute and require expensive upkeep. To mitigate this, energy-efficient scheduling should prioritise power supply

during key academic hours. Monitor generator fuel usage and maintenance data to allocate resources efficiently and repair quickly, improving academic reliability.

Enhancing digital infrastructure is another important step to keep academics running amid load shedding. The institution should improve Wi-Fi in lecture halls, libraries, and open learning spaces and increase server capacity for peak-hour logins. Moodle and Canvas, scalable learning solutions with low-bandwidth access and offline features, are needed. The school should finance portable internet devices, mobile routers, and monthly data packages to alleviate inequity, especially among disadvantaged students. Digital inequality worsens educational exclusion during load shedding, according to Adedoyin and Soykan (2020:863). Flash devices or shared network drives should be used to download digital course materials offline. A specialised IT support team must be developed to quickly resolve technical issues during outages, and digital resource accessibility measures like platform login rates and error reports should be tracked to assess system robustness and user experience.

Flexible academic rules that allow equal participation without compromising academic integrity must be institutionalised to mitigate power outage-related academic interruptions. For students who lose access during load shedding, faculty should use take-home exams, pre-recorded oral presentations, and asynchronous forum discussions. Course scheduling should be dynamic and load-shedding-aware to prevent teaching during peak outage hours. Hodges *et al.* (2020:27) say institutional flexibility is necessary in emergencies to maintain learning and lessen student anxiety. Students should have rolling submission deadlines and staggered assessments. Regular faculty training workshops should improve staff competency in low-tech and hybrid assessment methodologies. These flexibilities require anti-plagiarism and proctoring systems to maintain academic credibility. Students and professors should get policy documents outlining these flexible practises to promote transparency and responsibility.

Students experiencing psychological issues connected to load shedding should receive better academic and mental health help from the university. Institutions must provide virtual and physical support for psychological counselling, academic mentoring, and peer support groups. On-demand video counselling, campus-based helplines, and mindfulness and CBT smartphone apps should be available for mental

health services. Rajagukguk *et al.* (2024:46) recommend embedding psychological resilience programs for academic disturbances. Academic development units should also include stress management, outage time planning, and asynchronous learning skills training. Support services must be decentralised to remote campuses and student houses with greater outages. Monthly reports should track service uptake, user satisfaction, and case resolution timelines for accessibility. These findings should guide future academic cycle service enhancements and funding allocations to help students thrive despite disruptions.

Finally, a comprehensive monitoring and evaluation framework is needed to evaluate these interventions' efficacy and evolution. Academic staff, IT staff, infrastructure management, and student representatives should form a Load Shedding Response Task Team (LSRTT) to supervise implementation, address issues, and report on institutional readiness. Feedback surveys, helpdesk ticketing systems, academic performance measures, and mental health utilisation statistics will provide a complete picture of outcomes. Surveys can measure student satisfaction, resource access, and academic fairness during outages, while academic records can track grade and attendance improvements under new systems. Generator uptime, average assignment submission rates, and student counselling access must be recorded and assessed quarterly for each intervention. These recurrent feedback mechanisms will enable evidence-based policy change, accountability, and institutional resilience to future disturbances.

5.4 Limitations of the study

It is important to recognise that the study has some flaws. One big problem is that it only looks at one South African university of technology. This means that the results can't be used in other places. The results might not work for other schools or places with different situations. The study shows how load shedding impacts MBA students at the particular school, but the problems and answers found may be different in other places. To make the results more applicable to a wider range of universities, researchers should think about using a bigger sample (Bryman 2016:12).

Another problem with the study is that it only used a small group of people, so it might not show how different the experiences of other MBA students at universities are. Even though an effort was made to get a diverse sample, the small number of respondents

may not fully show the problems and perspectives of all students. More people in the group could give us a fuller picture of how load shedding affects students' schoolwork (Creswell and Poth 2018:65).

Another problem is that the data comes from interviews and surveys, which are self-reported. Self-reported data can be useful since it shows people's own experiences and thoughts, but it can also be biassed by things like social desirability and memory bias. People may not report or over-report some experiences, which could make the data wrong or unreliable. Adding records of academic achievement and attendance to self-reported data could make the results more reliable (Patton 2015:1).

Another problem with the study is that it must be limited by time. The study looks at how DUT MBA students dealt with load shedding during a certain time period. However, the study does not consider how often and how badly load shedding affects people since of changes in the power supply and government policies. Since of this, the study might not fully show long-term trends or what will happen in the future. Researchers could learn more about how load sharing affects students' learning over time by doing longitudinal studies (Yin 2018:1).

The study cannot be used in other places with different social, economic, and infrastructure situations since of where it was done. The effects of load shedding and the tools that can be used to lessen them can be very different in rural and urban areas, as well as in developed and developing areas. To get a fuller picture, future studies should investigate the effects of load sharing in a variety of geographical areas (Creswell and Poth 2018:65).

Lastly, the study does not consider the technology that is available to students or how well they know how to use it. Students can deal with load sharing better if they know how to use technology. Students with better digital literacy may be able to handle their schoolwork better when the power goes out, while students with less digital literacy may have a harder time. Adedoyin and Soykan 2020:863 say that more research should be done on how technology affects students' experiences and results during load shedding.

5.5 Implications for policy and practice

This study has major consequences for South African university policy-making and operational practise, particularly those afflicted by constant load shedding. First, equity-focused, student-centred mitigation solutions are needed due to the demographic diversity of students—urban to rural, high-income to low-income homes. Universities must prioritise uninterrupted teaching resources, especially for students without backup power or consistent internet connectivity at home. Renewable energy solutions and learning continuity mechanisms including offline-accessible course content, downloadable learning materials, and asynchronous assessment must be invested in. Involving academic, administrative, and student stakeholders in load shedding mitigation framework design and execution is crucial. Successful institutional interventions require coordinated, cross-sectoral coordination, making load-shedding taskforces with voices from every university operational layer vital, according to Yin (2018:6).

Policy implications go beyond infrastructure and necessitate academic delivery model restructuring for long-term flexibility and resilience. Institutional frameworks should include flexible learning schedules, remote access, and disruption-tolerant evaluation pathways. The university must explicitly specify academic policies that explain when and how such flexibility may be used to ensure academic standards are consistent and fair. Also, scalable infrastructure investment—especially in digital systems—is crucial. Policies should increase Wi-Fi capacity, online platform stability, and student data subsidies or freeness during outages. Institutionalise student mental health and well-being through psychological services, peer support networks, and resilience-building seminars. To help students cope with academic stress during outages, these programs should be integrated into campus policy. Universities can develop a robust academic ecosystem that can weather the energy crisis and future disruptions by addressing these policy and practice areas together.

5.6 Suggestions for future studies

Future research should encompass a range of areas to better understand and address the impacts of load shedding on educational institutions.

Comparative studies across institutions: In the future, researchers should look at how load sharing affects different types of students at more than one university.

Researchers may be able to find common problems and answers faster if they include institutions from a range of geographical and socioeconomic backgrounds. Comparative study can help you find the best ways to do things and come up with new ideas.

Longitudinal research: Load shedding can affect students' academic performance and well-being over time, as shown by longitudinal research. These studies can track student coping, institution response, and educational change. Longitudinal data can illuminate higher education load shedding's long-term effects (Yin 2018:6).

Technological interventions: In the future, researchers should look into how technology can help lessen the effects of load shedding on schooling. Finding out how well solar power works and improving digital infrastructure can help make sure that educational tools are always available. Giving students portable power solutions and data packages can also be looked at to see how they affect their academic performance and digital involvement (Yakobi and Yakobi 2024:1).

Mental health and well-being: Future studies should examine how load shedding affects student mental health. Studies can measure students' stress, anxiety, and other mental health difficulties during repeated power outages. Mental health support services and interventions can also be studied to help students manage (Alkaldy, Albaqir and Hejazi 2019:149).

Policy and institutional frameworks: The problems caused by load shedding should be looked at in terms of how policies and institutional systems are used. This can include looking at current policies on schooling and coming up with ways to make them better. For long-lasting solutions, better adaptability, and increased resilience to be put into action, institutions must have strong leadership and control (Patton, 2015:1).

Socio-economic disparities: Future research should examine how socioeconomic status affects load shedding and education. Studying how pupils from different socioeconomic backgrounds handle power outages can reveal resource and support gaps. This can help overcome the gap and promote education equity (Yende 2024:11).

5.7 Final remarks

South African higher education suffers from load shedding, which lowers student performance. This research examined how load shedding influenced MBA students'

resource availability, academic performance, and mental health at a university of technology. The results highlight the need for comprehensive and permanent measures to reduce the consequences of frequent power outages on education.

This report advocates backup power, renewable energy, and digital infrastructure spending. Flexible academic policies and excellent support services may aid institutions and students during crises. Industry-community partnerships may reduce load shedding. To further understand higher education load shedding issues and solutions, future research should address this study's limitations and build on its findings. Comparative and longitudinal studies, technological therapies, and mental health consequences may clarify this complex problem.

The study suggests that load shedding at HEIs needs institutional changes and proactive measures. The proposed methods of resilience and adaptability may help universities deliver high-quality instruction even amid frequent power outages. Sustainable and fair solutions will boost academic output and South Africa's economy.

REFERENCES

Acakpovi, A., Botwe-Ohenewaa, G. and Sackey, D. M. 2022. Impact of energy efficiency and conservation programs on the national grid in some selected households in Ghana. *Energy Efficiency*, 15: 5.

Adedoyin, O. B. and Soykan, E. 2020. Covid-19 pandemic and online learning: the challenges and opportunities. *Interactive Learning Environments*, 31(2): 863-875.

Akram, V. 2022. Causality between access to electricity and education: evidence from BRICS countries. *Energy Research Letters*, 3(2). https://doi.org/10.46557/001c.32597 1-10.

Al-Bahou, R., Bruner, J., Moore, H. and Zarrinpar, A. 2023. Quantitative methods for optimizing patient outcomes in liver transplantation. *Liver Transplantation*, 30(3): 311-320. https://doi.org/10.1097/lvt.0000000000000325

Alkaldy, E. A. H., Albaqir, M. A., and Akhavan Hejazi, M. S. 2019. A new load forecasting model considering planned load shedding effect. *International Journal of Energy Sector Management*, 13(1): 149-165. https://doi.org/10.1108/ijesm-03-2018-0008

Ally, M. 2008. Foundations of educational theory for online learning. In: Anderson, T. ed. *The theory and practice of online learning*. Athabasca, AB: Athabasca University Press, 15-44.

Amusa, H., Amusa, K. and Mabugu, R. 2009. Aggregate demand for electricity in South Africa: An analysis using the bounds testing approach to cointegration. *Energy Policy*, 37(10): 4167-4175.

Arain, G. A., Hameed, I., Khan, A. K., Strologo, A. D. and Dhir, A. 2022. How and when do employees hide knowledge from co-workers? *Journal of Knowledge Management*, 26(7): 1789-1806.

Atkinson, C. L., McCue, C., Prier, E. and Atkinson, A. M. 2020. Supply chain manipulation, misrepresentation, and magical thinking during the COVID-19 pandemic. *The American Review of Public Administration*, 50(6-7): 628-634.

Barella, Y., Fergina, A., Mustami, M. K., Rahman, U. and Alajaili, H. M. A. 2024. Quantitative methods in scientific research. *Terbitan Berkala Ilmiah Sociologique : Jurnal Mahasiswa Program Studi Sosiologi/Jurnal Pendidikan Sosiologi Dan Humaniora*, *15*(1), 281. https://doi.org/10.26418/j-psh.v15i1.71528

Bhorat, H. 2001. Explaining employment trends in South Africa: 1993-1998. *New Agenda South African Journal of Social and Economic Policy*, 4(2): 21-38.

Brahimi, M. A. and Leperlier, T. 2023. Quantitative methods in intellectual history. In: Geroulanos, S. and Sapiro, G. eds. *The Routledge handbook of the history and sociology of ideas.* London: Routledge, 100-115. https://doi.org/10.4324/9781003093046-8

Bruwer, J. P. and Van Den Berg, A. 2021. The conduciveness of the South African economic environment and small, medium and micro enterprise sustainability: a literature review. *Expert Journal of Business and Management*, 5(1): 1-12.

Bryman, A. 2016. *Social research methods*. Oxford: Oxford University Press.

Cohen, L., Manion, L. and Morrison, K. 2007. *Research methods in education*. 6th ed. London: Routledge.

Cohen, L., Manion, L. and Morrison, K. 2017. The ethics of educational and social research. In: Cohen, L., Manion, L. and Morrison, K. eds. *Research methods in education*. London: Routledge, 111-143.

Cooper, D. R. and Schindler, P. S. 2014. *Business research methods*. 12th ed. New York: McGraw-Hill Education.

Coy, M. J. 2019. Research methodologies: increasing understanding of the world. *International Journal of Scientific and Research Publications*, 9(1): 71-77.

Creswell, J. W., and Poth, C. N. 2018. *Qualitative inquiry and research design: choosing among five approaches*. Thousand Oaks, CA: SAGE Publications.

Crow, G. 2024. Quantitative and qualitative methods. *The Emerald guide to Ann Oakley* (*Emerald guides to social thought*). Leeds: Emerald, 65-86. https://doi.org/10.1108/978-1-80071-561-520241004

Dang, T. T. C., Van Nguyen, H., & Tran, P. T. T. 2024. Qualitative data collection. In: Bui, H. P. ed. *Applied linguistics and language education research methods: fundamentals and innovations*. IGI Global, 41-54. https://doi.org/10.4018/979-8-3693-2603-9.ch004

Dawson, D., Richardson, J., Troyer, A., Binns, M., Clark, A., Polatajko, H., Winocur, G., Hunt, A. and Bar, Y. 2014. An occupation-based strategy training approach to managing age-related executive changes: a pilot randomized controlled trial. *Clinical Rehabilitation*, 28(2): 118-127.

De Vos, A. S., Strydom, H., Fouché, C. B., and Delport, C. S. L. 2012. *Research at grass roots for the social sciences and human service professions*. 4th ed. Pretoria: Van Schaik.

Di Giovine, M. A. 2016. World heritage. In: Jafari, J. and Xiao, H. eds. *Encyclopedia of tourism*. Cham: Springer, 1025-1026.

Dlamini, S. P. 2021. Exploring the identities of progressed learners in four township schools: a phenomenological study. Doctoral thesis, University of the Witwatersrand, Johannesburg, South Africa 1-19.

Du Preez, H. 2020. The case for a universal basic income in South Africa: a conceptual approach. *SSRN*. https://dx.doi.org/10.2139/ssrn.3784371: 1-10.

Dzwigol, H. 2020. Tools for adjusting research methods and techniques to research processes. *Экономический вестник Донбасса*, 4(62): 110-118.

Elom, C. O., Onyeneke, R. U., Ayerakwa, H. M., Atta-Ankomah, R., Deffor, E. W. and Uwaleke, C. C. 2024. The role of information and communication technologies and access to electricity on education in Africa. *Education and Information Technologies*. https://doi.org/10.1007/s10639-024-12504-6 1-10.

Fife, S. T. and Gossner, J. D. 2024. Deductive qualitative analysis: evaluating, expanding, and refining theory. *International Journal of Qualitative Methods*, 23. https://doi.org/10.1177/16094069241244856

Harling, G., Gumede, D., Mutevedzi, T., McGrath, N., Seeley, J., Pillay, D., Bärnighausen, T. W. and Herbst, A.J. 2017. The impact of self-interviews on response

patterns for sensitive topics: a randomized trial of electronic delivery methods for a sexual behaviour questionnaire in rural South Africa. *BMC Medical Research Methodology*, 17: 125.

Hepler, S. M. 2024. Strategies that center equity and support well-being within all-women academic virtual research teams. Doctoral thesis, Georgia State University, Atlanta GA, USA 1-19.

Hodges, C., Moore, S., Lockee, B., Trust, T. and Bond, A. 2020. The difference between emergency remote teaching and online learning. *Educause Review*, 27. https://er.educause.edu/articles/2020/3/the-difference-between-emergency-remote-teaching-and-online-learning

Hossain, M. S., Alam, M. K. and Ali, M. S. 2024. Phenomenological approach in the qualitative study: data collection and saturation. *ICRRD Quality Index Research Journal*, 5(2). https://doi.org/10.53272/icrrd.v5i2.4

Kamolov, S. and Tarazevich, M. 2023. Quantitative methods for executive public managers. *E3S Web of Conferences*, 403, 08002. https://doi.org/10.1051/e3sconf/202340308002

Karoly, L. A. and Walsh, S. J. 2020. *Estimating the cost of quality early childhood care and education in Oklahoma*. Santa Monica, CA: RAND 1-10.

Kawar, L. N., Dunbar, G. B., Aquino-Maneja, E. M., Flores, S. L., Squier, V. R. and Failla, K. R. 2024. Quantitative, qualitative, mixed methods, and triangulation research simplified. *The Journal of Continuing Education in Nursing* 55(7): 338-344. https://doi.org/10.3928/00220124-20240328-03

Khoza, S. 2024. Navigating the dark: understanding the impact of load-shedding on Learning Management Systems (LMS) in South African Universities. *International Journal of Research in Business and Social Science (2147-4478)*, 13(2), 345-352. https://doi.org/10.20525/ijrbs.v13i2.3134

Kohler, M. 2014. Differential electricity pricing and energy efficiency in South Africa. *Energy*, 64: 524-532.

Krugman, P. R. 2008. Trade and wages, reconsidered. *Brookings papers on economic activity*, 2008(1): 103-154.

Kumar, S., Sahoo, S., Lim, W. M., Kraus, S. and Bamel, U. 2022. Fuzzy-set qualitative comparative analysis (fsQCA) in business and management research: A contemporary overview. *Technological Forecasting and Social Change*, 178: 121599.

Lee, N. 2021. *Load-shedding affects education as modern learning relies on electricity.* Available online: https://www.sowetanlive.co.za/opinion/columnists/2021-11-17-load-shedding-affects-education-as-modern-learning-relies-on-electricity/ (Accessed 7 June 2024).

Lingham, N. 2011. A knowledge management framework for automotive component manufacturers in the Eastern Cape. Master's dissertation, Nelson Mandela Metropolitan University, Port Elizabeth, South Africa.

Makube, T. 2019. The importance of using different methods of analysis in dealing with the challenges of collusive tendering and other forms of corruption in the South African public procurement system. *African Public Procurement Law Journal*, 6(1).

Malik, A. A., Memon, P. A., Ali, H., Mallah, M. A., Bux, K. and Haq, M. U. 2022. Impacts of coping strategies for electricity load shedding among university students. *Pakistan Journal of Medical & Health Sciences*, 16(5): 1165-1167.

Maluleke, R. 2019. A pedagogy for technology education: an indigenous perspective. Doctoral thesis, University of South Africa, Pretoria, South Africa 13-15.

Manamperi, I., Ahmad, I., Habibi, D. and Aziz, A. 2023. *Assessing the effects of low load on under-frequency load shedding schemes and exploring potential solutions: a review*. 2023 International Conference on Sustainable Technology and Engineering (i-COSTE), Nadi, Fiji, https://doi.org/10.1109/i-coste60462.2023.10500774 1-10.

Mannheimer, S. 2024. Qualitative data reuse in practice. In: *Scaling up: how data curation can help address key issues in qualitative data reuse and big social research. Synthesis lectures on information concepts, retrieval, and services.* Cham: Springer, 25-45. https://doi.org/10.1007/978-3-031-49222-8_3

Masibi, K. B. 2015. The impact of load shedding on ICT enterprises in Matlosana. Master's dissertation, North-West University, Mafikeng, South Africa.

Matsheta, R. M. and Sefoka, I. M. 2023. Load-shedding in South Africa: an immediate threat to the right to education, Section 29 inquiry. *Journal of Educational and Social Research*, 13(1): 216.

Mbazima, S. J. Masekameni, M. D. and Mmereki, D., 2022. Waste-to-energy in a developing country: the state of landfill gas to energy in the Republic of South Africa. *Energy Exploration & Exploitation*, 40(4): 1287-1312.

McMillan, J. H. and Schumacher, S. 2014. *Research in education: evidence-based inquiry*. Upper Saddle River, NJ: Pearson.

Modugno, L. 2024. Evaluating qualitative expectational data on investments from business surveys. *Journal of Business Cycle Research*. https://doi.org/10.1007/s41549-024-00094-8

Mokoena, D. H. 2018. The influence of continuous electricity supply on selected commercial customers in Klerksdorp. Doctoral thesis, North-West University, Potchefstroom, South Africa.

Monyei, C. G., Jenkins, K. E., Serestina, V. and Adewumi, A. O. 2018. Examining energy sufficiency and energy mobility in the global south through the energy justice framework. *Energy Policy,* 119: 68-76.

Mthanti, B. J. 2023. A descriptive learning analytics: an online learning programmes and load-shedding conundrum. *E-Journal of Humanities Arts and Social Sciences*, 4 (12): 161-174. https://doi.org/10.38159/ehass.202341214

Muftić, M. D., Avdaković, S., Alihodžić, A., Dautbašić, N., Memić, A. and Mujezinović, A. 2023. Adaptive under frequency load shedding using center-of-inertia frequency. In: Ademović, N., Kevrić, J. and Akšamija, Z. eds. Advanced technologies, systems, and applications VIII. IAT 2023. *Lecture notes in networks and systems,* vol. 644. Cham: Springer, 606-615. https://doi.org/10.1007/978-3-031-43056-5_46

Mungai, R. 2019. Using efficient market theory and behavioral finance theory to investigate the impact of investor confidence: lessons from global financial crises. Master's dissertation, University of the Western Cape, Bellville, South Africa, 3-15.

Naeem, M., Ozuem, W., Howell, K. and Ranfagni, S. 2024. Demystification and actualisation of data saturation in qualitative research through thematic analysis. *International Journal of Qualitative Methods, 23*. https://doi.org/10.1177/16094069241229777

Naidoo, C. 2023. The impact of load shedding on the South Africa economy. *Journal of Public Administration*, 58(1): 7-16.

National Energy Regulator of South Africa. 2015. *Strategic Plan 2015/16 – 2019/20*. Pretoria: National Energy Regulator of South Africa.

Ndlovu, L. 2019. A design based research on students' understanding of quadratic inequalities in a graphing calculator enhanced environment. Doctoral thesis, Stellenbosch University, Stellenbosch, South Africa.

Ngcobo, R. and De Wet, M. C. 2024. The impact of financial development and economic growth on renewable energy supply in South Africa. *Sustainability*, 16(6): 2533.

Nieuwenhuis, O. C. 2021. Exploring the relationship between ideas about time and student stress: a meta-ethnography. Master's dissertation, Utrecht University, Netherlands 22-30.

Nowlin, M. C. and Wehde, W. 2024. Teaching quantitative methods to students of public policy. In: St.Deny, E. and Zittoun, P. eds. *Handbook of teaching public policy*. Cheltenham: Edward Elgar Publishing, 168-180. https://doi.org/10.4337/9781800378117.00022

O'Regan, J. P. 2021. *Global English and political economy*. London: Routledge :15-17.

Pandey, B., Brelsford, C. and Seto, K. C. 2022. Infrastructure inequality is a characteristic of urbanization. *Proceedings of the National Academy of Sciences*, 119(15): e2119890119.

Patton, M. Q. 2015. *Qualitative research and evaluation methods: integrating theory and practice*. Thousand Oaks, CA: SAGE Publications.

Pham, C. H. 2024. Qualitative data analysis. In: Bui, H. P. ed. *Applied linguistics and language education research methods: fundamentals and innovations*. IGI Global, 55-69. https://doi.org/10.4018/979-8-3693-2603-9.ch005

Pollet, B. G., Staffell, I. and Adamson, K. A. 2015. Current energy landscape in the Republic of South Africa. *International Journal of Hydrogen Energy*, 40(46): 16685-16701.

Rajagukguk, A., Ervianto, E., Firdaus, F. and Dika, R. 2024. Analysis of under frequency load shedding system. *International Journal of Electrical Energy and Power System Engineering*, 7(1) https://doi.org/10.31258/ijeepse.7.1.46-54

Rankin, R. and Rousseau, P. G. 2008. Demand side management in South Africa at industrial residence waterheating systems using in line water heating methodology, *Energy Conversion and Management*, 49(1): 62-74.

Rendón, N. A. and Martínez, N. F. 2024. Impact of project-based learning on conceptual achievements and motivation of technology students in electricity. *World Journal of Advanced Engineering Technology and Sciences*, 12(2): 001-008. https://doi.org/10.30574/wjaets.2024.12.2.0262

Reyes, V., Bogumil, E. and Welch, L. E. 2021. The living codebook: documenting the process of qualitative data analysis. *Sociological Methods & Research*, 53(1): 89-120. https://doi.org/10.1177/0049124120986185

Sadiki, M. 2015. Financial assistance to state-owned enterprises by the state in South Africa: A case study of Eskom. Master's dissertation, University of South Africa, Pretoria, South Africa.

Sardana, N., Shekoohi, S., Cornett, E. M. and Kaye, A. D. 2023. Qualitative and quantitative research methods. In: Kaye, A. D., Urman, R. D., Cornett, E. M. and Edinoff, A. N. eds. *Substance use and addiction research*. Cambridge, MA: Academic Press, 65-69. https://doi.org/10.1016/b978-0-323-98814-8.00008-1

Saunders, M., Lewis, P. and Thornhill, A. 2012. *Research methods for business students*. 6th ed. Harlow: Pearson Education.

Schoeman, T. and Saunders, M. 2018. *The impact of power outages on small businesses in the City of Johannesburg*. In: 10th International Conference on Education, Business, Humanities and Social Sciences Studies. November 19-20, Cape Town.

Schurink, W., Fouché, C. B. and De Vos, A. S. 2011. Qualitative data analysis and interpretation. In De Vos, A. S., Strydom, H., Fouché, C. B. and Delport, C.S.L. eds. *Research at grass roots: for the social sciences and human service professions*. 4th ed. Pretoria: Van Schaik, 397-423.

Seale, C. 1999. *The quality of qualitative research*. London: Sage Publications.

Sekaran, U. and Bougie, R. 2016. *Research methods for business: a skill building approach*. New York: John Wiley.

Selelo, L. R., Madigele, P. K., Ntaka, P. and Moetedi, K. 2017. The effects of extended water supply disruptions on the operations of SMEs. *Southern African Business Review*, 21(1): 480-500.

Shenton, A. K. 2004. Strategies for ensuring trustworthiness in qualitative research projects. *Education for Information*, 22(2): 63-75.

Silverman, D. 2005. Instances or sequences? Improving the state of the art of qualitative research. *Forum: Qualitative Sozialforschung / Forum: Qualitative Social Research,* 6(3).

Stats SA. 2023. *Fact Sheet on Access to Tertiary Education Country Comparison using Gross Enrolment Ratio (2023)*. Available at: https://lmi-research.org.za/publication/access-to-tertiary-education-country-comparison-using-gross-enrolment-ratio-2023/ (Accessed 7 June 2024).

Steenkamp, H., February, A., September, J., Taylor, A., Hollis-Turner, S. and Bruwer, J. P. 2016. The influence of load shedding on the productivity of hotel staff in Cape Town, South Africa. *Expert Journal of Business and Management*, 4(2): 69-77.

Streatfeild, J. 2019. Nepal's electricity security: using political economy analysis to illuminate the reform path. In: Farhad Taghizadeh-Hesary, F. Yoshino, N., Chang, Y. and Rillo, A. D. eds. *Achieving energy security in Asia: diversification, integration and policy implications* (pp. 131-149). World Scientific Publishing

Sun, H. and Ye, J. 2024. Research on quantitative assessment method for fire spread risk in enclosed buildings. *Fire Technology*, 60: 3709-3738. https://doi.org/10.1007/s10694-024-01588-8

Taherdoost, H. 2021. Data collection methods and tools for research; a step-by-step guide to choose data collection technique for academic and business research projects. *International Journal of Academic Research in Management*, 10(1): 10-38.

Thom, C. 2000. Use of grid electricity by rural households in South Africa. *Energy for Sustainable Development*, 4(4): 36-43.

Thomas, G., Lynch, M. and Spencer, L. H. 2021. A systematic review to examine the evidence in developing social prescribing interventions that apply a co-productive, co-designed approach to improve well-being outcomes in a community setting. *International Journal of Environmental Research and Public Health*, 18(8): 3896.

Welman, M. 2019. The starting point: structuring Newark's land use laws at the outset of redevelopment to promote integration without displacement. *Columbia Journal of Law and Social Problems*, 53: 44-87.

Winardi, B., Sinuraya, E. W., Karnoto, K. and Zm, A. A. 2024. Simulation of electrical load with an over load system shedding. *Engineering and Technology International Journal*, 6(01): 38-43. https://doi.org/10.55642/eatij.v6i01.654

Yakobi, K. and Yakobi, S. 2024. Online learning support as a pedagogical strategy for student learning in the developing universities in South Africa: a literature review. *Preprints* 2024, 2024080421. https://doi.org/10.20944/preprints202408.0421.v1

Yende, S. J. 2024. Influence of load shedding in South African higher education: a qualitative content analysis of schools of music. *Cogent Education*, 11(1). https://doi.org/10.1080/2331186X.2024.2359338

Yin, R. K. 2018. *Case study research and applications: design and methods*. 6th ed. Thousand Oaks: Sage Publications.

Proctor, T. (2024). Qualitative data analysis. *ResearchGate*. https://www.researchgate.net/publication/381565026_Qualitative_data_analysis. 1-5

Bell, E., Bryman, A., & Harley, B. (2022). Qualitative Data Analysis. In *Oxford University Press eBooks*. https://doi.org/10.1093/hebz/9780198869443.003.0037 1-10

APPENDICES

Appendix 1: Letter of information

LETTER OF INFORMATION

Title of the Research Study: The effects of load shedding on MBA students' learning at a selected university of technology in South Africa.

Principal Investigator/s/researcher: Sicelo Lungelo Biyela, Honors in Management
Co-Investigator/s/supervisor/s: Dr Andrew Ronald Kamwendo, PhD
Dr Serathi Molokwane, PhD

Greetings, thank you for showing interest in this study. I am a student registered for the Master of Business Administration at the Durban University of Technology. I would like to invite you to participate in this study.

The aim of this study is to investigate the effects of load shedding post graduate education. This is important given existing evidence of continued loadshedding. Therefore, I would like to invite you to participate in the study by responding to the interview attached.

Your participation in the study is voluntary and under no circumstances should you feel uncomfortable. I would like to emphasize that you can withdraw from the study at any time should you feel uncomfortable to continue participating. As part of the procedure, I will give you an interview that you would go through and complete as honestly and freely as possible. If you need us to go through the questions together, I will gladly go through the questions with you.

Participating in this study should not result in you experiencing any discomfort or significant risk. I will not perform any painful procedure on you or on anyone from your household. Therefore, there will be no discomfort or risk to you as a participant. Furthermore, there will be no negative consequences if you choose not to participate or withdraw participation in the interview. There will also be no expected injuries from participating in this study.

As mentioned earlier, you can choose to withdraw or stop participating in the study at any time without having to provide reason. There will be no negative consequence if you decide to withdraw your participation. Kindly also note that we will withdraw you from the study if you do not follow the instructions given or decided not to honour your commitment.

Kindly also note that you will not be compensated for your participation in the interview. Your participation is voluntary and will inform policy making and the academic literature. Further, it is important to also indicate that you will not incur any expenses by participating in this study.

The information collected in this study will be managed and stored in a manner that ensures that your confidentiality and anonymity is always maintained. Kindly avoid recording your personal and any other identifying information.

The results of this study will be published after the data has been thoroughly analysed. If any findings emerge during the research, we will make all respondents aware of such.

Please note that the data collected in this study will be stored in a manner that ensures that your confidentiality and anonymity is maintained. All completed interviews will be stored in my supervisor's office in a locked cupboard for a period of up to 5 years. Only myself and my supervisor will have access to the completed interviews.

Persons to contact in the Event of Any Problems or Queries:

In the event of any problem or query, please contact me on 079 157 4485 or biyelasicelo@gmail.com. You can also contact my supervisors Dr Andrew Ronald Kamwendo contactable on andrewk@dut.ac.za and Dr Serathi Molokwane contactable on revelationm@dut.ac.za

Alternatively, you can call the DUT-Institutional Research Ethics Administrator on 031 373 2375 or report complaints to the Acting Director: Research and Postgraduate Support on researchdirector@dut.ac.za

Appendix 2: Consent letter

CONSENT

Full Title of the Study: The effects of load shedding on MBA students' learning at a selected university of technology in South Africa.

Names of Researcher/s: Mr Sicelo Lungelo Biyela

Statement of Agreement to Participate in the Research Study:

- I hereby confirm that I have been informed by the researcher, Mr. Sicelo Lungelo Biyela about the nature, conduct, benefits, and risks of this study - Research Ethics Clearance Number
- I have also received, read, and understood the above written information (Participant Letter of Information) regarding the study.
- I am aware that the results of the study, including personal details regarding my sex, age, date of birth, initials and diagnosis will be anonymously processed into a study report.
- In view of the requirements of research, I agree that the data collected during this study can be processed in a computerized system by the researcher.
- I may, at any stage, without prejudice, withdraw my consent and participation in the study.
- I have had sufficient opportunity to ask questions and (of my own free will) declare myself prepared to participate in the study.
- I understand that significant new findings developed during this research which may relate to my participation will be made available to me.

Full Name of Participant	**Date**	**Time**	**Signature / Right Thumbprint**

Mr. Sicelo Lungelo Biyela

Full Name of Researcher	**Date**	**Signature**
Full Name of Witness (If applicable)	**Date**	**Signature**

Appendix 3: Ethical clearance letter

Institutional Research Ethics Committee
Research and Postgraduate Support Directorate
2nd Floor, Berwyn Court
Gate 1, Steve Biko Campus
Durban University of Technology

P O Box 1334, Durban, South Africa, 4001

Tel: 031 373 2375
Email: lavishad@dut.a.cza
http://www.dut.ac.za/research/institutional_research_ethics

www.du t.ac.za

15 May 2024

Mr S L Biyela
Postnet x 20004
Suite 42
Empangeni
3880

Dear Mr Biyela

The effects of load shedding on MBA students' learning at a selected university of technology in South Africa
Ethics Clearance Number: IREC 017/24

The DUT-Institutional Research Ethics Committee acknowledges receipt of your final data collection tool for review.

We are pleased to inform you that the data collection tool has been approved. Kindly ensure that participants used for the pilot study are not part of the main study.

In addition, the DUT-IREC acknowledges receipt of your gatekeeper permission letter.

Please note that FULL APPROVAL is granted to your research proposal. You may proceed with data collection.

Any adverse events [serious or minor] which occur in connection with this study and/or which may alter its ethical consideration must be reported to the DUT-IREC according to the DUT-IREC SOP's.

Please note that any deviations from the approved proposal require the approval of the DUT-IREC as outlined in the DUT-IREC SOP's.

It is compulsory for a student or researcher to apply for recertification on an annual basis. The failure to do so will result in withdrawal of ethics clearance. It is the responsibility of the researcher and the supervisor to apply for recertification.

Please note that you are required to submit a Notification of Completion of Study form together with an abstract to the DUT-IREC office on completion of your study.

Yours Sincerely

Prof J K Adam
Chairperson: DUT-IREC

Appendix 4: Request for gatekeeper's permission

Directorate for Research and Postgraduate Support

3rd Floor, Open House, Steve Biko Campus
Durban University of Technology
P O Box 1334, Durban, 4000

T +27 373 2577
E [redacted]
W [redacted]

26 March 2024

Mr S L Biyela
c/o Department of Business school
Faculty of Management sciences
Durban University of Technology

Dear Mr Biyela

PERMISSION TO CONDUCT RESEARCH AT THE DUT

Your email correspondence in respect of the above refers. I am pleased to inform you that the Institutional Research and Innovation Committee (IRIC) has granted **Gatekeeper Permission** for you to conduct your research "The effects of load shedding on MBA students' learning at a selected university of technology in South Africa" at the Durban University of Technology. **Kindly note that this letter must be issued to the IREC for approval before you commence data collection.**

The DUT may impose any other condition it deems appropriate in the circumstances having regard to nature and extent of access to and use of information requested.

Upon completion of your research project, you are requested to share the summary of your key research findings.

Yours sincerely

Dr F Akpa-Inyang
(for) Dr V Govender
Director (acting)
Research and Postgraduate Support

Appendix 5: Draft interview for academic staff

The Effects of Load Shedding on Teaching and Learning. A Case Study of the MBA students at the selected University

My name is Mr Sicelo Lungelo Biyela, a Master of Business Administration student in the Business School at the Durban University of Technology. I am conducting research to investigate the effect of load shedding on teaching and learning for MBA students at the Durban University of Technology. This interview collects opinions the effects of Load Shedding on Teaching and Learning activities in the school. Kindly note that all information collected will be used for academic purposes only and all personal information will be treated confidentially. Please take some time to answer the following questions as truthful as possible.

Date: …….. Place: …….

GENERAL QUESTIONS

1. How often do you experience load shedding in your school?
ANSWER:
2. How has load shedding affected your academic duties in your school?
ANSWER:
3. How has load shedding affected your other duties in your school?
ANSWER:
4. In what ways has load shedding affected your overall academic productivity in the school?
ANSWER:
5. What is the frequency and duration of load-shedding occurrences during the academic year within the school?
ANSWER:
6. What strategies can you recommend for improving overall lecturing/academic productivity in the school during load shedding?
ANSWER:
7. In your view, what role should students play in advocating for solutions to mitigate the impact of load shedding on academic activities?
ANSWER:
8. What support, if any, have you received from the university administration or faculty to address the challenges posed by load shedding?
ANSWER:
9. How do you perceive the overall impact of load shedding on the learning environment at Durban University of Technology?
ANSWER:
10. How do you think the experience of load shedding at Durban University of Technology compares to other universities or educational institutions in the region?
ANSWER:

Thank you for taking your time to participate in this interview.

Appendix 6: Draft interview for administrative staff

The Effects of Load Shedding on Teaching and Learning. A Case Study of the MBA students at the selected University

My name is Mr Sicelo Lungelo Biyela, a Master of Business Administration student in the Business School at the Durban University of Technology. I am conducting research to investigate the effect of load shedding on teaching and learning for MBA students at the Durban University of Technology. This interview collects opinions the effects of Load Shedding on Teaching and Learning activities in the school. Kindly note that all information collected will be used for academic purposes only and all personal information will be treated confidentially. Please take some time to answer the following questions as truthful as possible.

Date: …… Place: ……

GENERAL QUESTIONS

1. How often do you experience load shedding in your school?
ANSWER:
2. How has load shedding affected your administrative duties in your school?
ANSWER:
3. How has load shedding affected your other duties in your school?
ANSWER:
4. In what ways has load shedding affected your overall academic productivity in the school?
ANSWER:
5. What is the frequency and duration of load-shedding occurrences during the academic year within the school?
ANSWER:
6. What strategies can you recommend for improving overall administrative productivity in the school during load shedding?
ANSWER:
7. In your view, what role should students play in advocating for solutions to mitigate the impact of load shedding on academic activities?
ANSWER:
8. What support, if any, have you received from the university administration or faculty to address the challenges posed by load shedding?
ANSWER:
9. How do you think the experience of load shedding at Durban University of Technology compares to other universities or educational institutions in the region?
ANSWER:
10. How do you perceive the overall impact of load shedding on the learning environment at Durban University of Technology?
ANSWER:

Thank you for taking your time to participate in this interview.

Appendix 7: Draft interview for students

The effects of load shedding on MBA students' learning at a selected university of technology in South Africa

My name is Mr Sicelo Lungelo Biyela, a Master of Business Administration student in the Business School at the Durban University of Technology. I am conducting research to investigate the effects of load shedding on MBA learning at the Durban University of Technology. This interview collects opinions the effects of Load Shedding on post graduate education activities in the school. Kindly note that all information collected will be used for academic purposes only and all personal information will be treated confidentially. Please take some time to answer the following questions as truthful as possible.

Date:……. Place:…….

GENERAL QUESTIONS

1. How is your experience with load shedding during your period of study at the Durban University of Technology?
ANSWER:
2. How often do you experience load shedding in your school?
ANSWER:
3. How has load shedding affected the provision of educational activities in your school such as attending lectures and tutorials, and writing test, assignments, and exams?
ANSWER:
4. What is the effect of load shedding on your academic performance while studying at the Durban University of Technology?
ANSWER:
5. What are your perceptions regarding the disruptions caused by load shedding on teaching and learning activities while studying at the Durban University of Technology?
ANSWER:
6. What is the frequency and duration of load-shedding occurrences during the academic year within the DUT MBA programme?
ANSWER:
7. To what extent does load shedding affect access to electronic resources, including online lectures, research materials, and communication tools, within the MBA programme?
ANSWER:
8. What strategies can you recommend for improving academic performance among students during load shedding in your school?
ANSWER:
9. What support, if any, have you received from the university administration or faculty to address the challenges posed by load shedding?
ANSWER:
10. Can you share any personal strategies or adaptations you've developed to cope with load shedding while maintaining your academic responsibilities?
ANSWER:

Thank you for taking your time to participate in this interview.

Appendix 8: Editing certificate

DR RICHARD STEELE
BA HDE MTech(Hom)
HOMEOPATH
Registration No. A07309 HM
Practice No. 0807524
Freelance academic editor
Associate member: Professional Editors' Guild, South Africa

154 Magenta Place
Gxarha [Morgan Bay]
5292
Eastern Cape

082-928-6208
rsteele@vodamail.co.za
rsteele201@outlook.com

EDITING CERTIFICATE

Re: **Sicelo Lungelo Biyela**
For editing DUT MBA dissertation: **The Effects of Load Shedding on MBA Students' Learning at a Selected University of Technology in South Africa**

I confirm that I have edited this dissertation and the references for clarity and language. I returned the document to the author with track changes so correct implementation of the changes and clarifications requested in the text and references is the responsibility of the author. I am a freelance editor specialising in proofreading and editing academic documents. My original tertiary degree which I obtained at the University of Cape Town was a B.A. with English as a major and I went on to complete an H.D.E. (P.G.) Sec. with English as my teaching subject. I was a part-time lecturer in the Department of Homoeopathy at the Durban University of Technology for 13 years and supervised many master's degree dissertations during that period.

Dr Richard Steele
27 August 2024
per email

Appendix 9: Turnitin report

Chapter1-5.docx

ORIGINALITY REPORT

5%	2%	0%	3%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	Submitted to Mancosa Student Paper	1%
2	business.expertjournals.com Internet Source	<1%
3	Submitted to Teaching and Learning with Technology Student Paper	<1%
4	Submitted to University of South Africa (UNISA) Student Paper	<1%
5	Submitted to North West University Student Paper	<1%
6	Submitted to University of KwaZulu-Natal Student Paper	<1%
7	Submitted to Durban University of Technology Student Paper	<1%
8	Submitted to Regenesys Business School Student Paper	<1%

9	Submitted to University of Johannsburg Student Paper	<1%
10	erepository.uonbi.ac.ke Internet Source	<1%
11	openscholar.dut.ac.za Internet Source	<1%
12	Saarinen, Carrie L.. "The Multidimensional Aspects of Being an Academic Chief Information Officer: A New Institutionalism Perspective.", Northeastern University, 2019 Publication	<1%
13	vital.seals.ac.za:8080 Internet Source	<1%
14	www.interest.co.nz Internet Source	<1%
15	etd.aau.edu.et Internet Source	<1%
16	Kerianne Lawson. "Electricity outages and residential fires: Evidence from Cape Town, South Africa", South African Journal of Economics, 2022 Publication	<1%
17	autodocbox.com Internet Source	<1%
18	Submitted to University of South Africa Student Paper	

		<1%
19	Submitted to University of Cape Town Student Paper	<1%
20	eprints.utar.edu.my Internet Source	<1%
21	ulspace.ul.ac.za Internet Source	<1%
22	core.ac.uk Internet Source	<1%
23	scholar.sun.ac.za Internet Source	<1%
24	umispace.umi.ac.ug Internet Source	<1%
25	www.wrc.org.za Internet Source	<1%

Exclude quotes	On	Exclude matches	< 10 words
Exclude bibliography	On		

Supervisor : Dr Andrew Kamwendo

Signature :

Date :09/09/2024