Coping or Collapsing? An Assessment of Load Shedding Coping Mechanisms at the National Institute of Public Administration Livingstone Campus, Zambia

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ABSTRACT

This study investigated the effectiveness of coping mechanisms in alleviating the burden of load shedding on public higher education institutions in Zambia, using the National Institute of Public Administration's Livingstone campus as a case study. The research was prompted by the increasing frequency of power outages in the country, which continue to disrupt institutional operations particularly in educational settings that depend heavily on ICT infrastructures, digital platforms, and uninterrupted administrative processes. A mixed-methods design was employed, combining quantitative data from 168 structured questionnaires administered to students selected through simple random sampling, with qualitative insights gathered through five key informant interviews with lecturers and administrative staff selected purposively for their direct involvement in institutional decision-making on load shedding. The questionnaire was pre-tested and reviewed by experts to establish its reliability and validity prior to full administration. Descriptive statistics, including means and standard deviations, were calculated for quantitative data, while thematic analysis was applied to open-ended responses.

The findings revealed that institutions adopted a range of coping strategies, including the use of generators, solar panels, backup ICT systems, and management coordination frameworks. Among these, management coordination emerged as the most practically applicable strategy, whereas solar systems and ICT backups proved less effective due to limited capacity and recurrent disrepair. Although these measures provided temporary relief, they did not eliminate the operational disruptions caused by load shedding. ICT-dependent academic work, administration, and institutional processes continued to be significantly hampered. The study concludes that the coping mechanisms currently in place are not only fragile but also problematic, reflecting the contentious institutional environments shaped by Zambia's structural energy crisis. In response, the research recommends strategic energy planning at the institutional level, substantial investment in renewable energy sources, and the adoption of hybrid energy systems to build long-term resilience.

Keywords: Load shedding, coping mechanisms, higher education institutions, energy resilience

INTRODUCTION

Electricity is a fundamental infrastructural need for the functioning of all institutions, but particularly higher learning institutions where teaching and learning, research and administration increasingly depend on digital systems. In Zambia but, the repeated load shedding has become a permanent problem affecting institutional efficiency, service delivery, and continuity of academics.

Electricity cost and instability have a greater impact than operational inconvenience and has become a macro socio economic limitation across sectors. Indicative of the impact to local economies and the local economy of

service delivery systems, there is evidence of a monumental loss in productivity at the home, business and public institutions levels due to load shedding (Bwalya Umar et al., 2022). Phiri (2025) similarly describes Zambian electricity rationing as "economic blackouts" suggesting that this is a systemic issue that is not only detrimental to the country's development, but also to the continuity of institutions.

The education sector suffers a critical blow as well due to reliance on ICT based systems. They are integrated into all levels of education in teaching and learning, administration and management, and examinations. Also, these systems become unusable during power outages, which means service interruptions, lost information, and slow academic work. It has been found that the presence of energy poverty negatively impacts quality education and the functionality of any institution in schools and classrooms (Mukanema et al, 2026).

At a student level, load shedding has been associated with reduced time for studying, heightened sense of anxiety, and impaired accessibility to digital learning materials. According to Malik et al (2022), academic performance and learning effectiveness of university students can be severely affected by stress caused as a result of load shedding. Along similar lines, in South Africa power cuts represent an enormous challenge for students attempting to balance their studies (Laher et al, 2026; Pungwa and Moonasamy, 2024).

Load shedding has caused challenges in service or academic program provision and has often affected ICT systems in the NIPA Livingstone Campus. These include learning management software, student registration services, and administrative databases. This is similar to the trend amongst Zambian SMEs and service institutions that show outages result in operational inefficiencies beyond what is already in place in terms of coping mechanisms (Nkhuwa and Silwimba, 2025).

Institutions cope with this form of disruption through generators, solar power, and administrative rescheduling. But, these have proven to be products more of forces of reactivity than a component of strategy. Generators, for instance, can provide only temporary and partial relief as they are limited by the availability of fuel, maintenance costs, and hours of use (Charity& Simon 2023). Along the same line, another study shows how, in many of these developing institutional settings, solar energy systems are still not up-to-capacity, and won't be able to provide the energy needed for high demand uses like ICT labs, and server systems (Alisinda and Chisumbe, 2026).

Evidence that would support this finding in educational and business settings, highlights that coping mechanisms should not be expected to absorb or eliminate structural barriers created by load shedding. Even with some coping mechanisms, SME businesses in Zambia are still unable to operate normally (Kintu, 2022; Mutambo, 2023). The same problems have been identified in the hospitality/ services sectors in which only part of the work continues under electricity blackouts through backup systems (Tembe and Hlengwa 2022).

In addition to its institutional impacts, the instability of electricity also impacts the welfare and security conditions of households. Load shedding has reportedly resulted in a loss of reliable communication and a lack of lighting which heightens insecurity and vulnerability within communities (Chirwa and Chilufya, 2024). These additional set of barriers creates societal implications that also make the electricity problem in Zambia systemic.

Some coping mechanisms have been adopted institutionally, but have not staved off institutional operational disablement that continues to be pervasive. This presents a challenge of sustainability and viability of present approaches particularly in highly demanding environments such as the higher learning institutions where a constant supply of electricity is needed to not only keep the ICT systems functional but also keep the academics afloat.

REVIEW OF LITERATURE

Load shedding is thus becoming an institutional challenge of increasing significance in countries with an unstable electrical supply in which state services and operations are dependent on digitized and bureaucratic processes. On top of that, electricity is required for lighting and using classrooms as well as for teaching and researching, examinations, learning management systems and student registration as well as other

communications and administrative platforms and databases. So load shedding expands beyond a mere inconvenience to also a directly impact on often the continuity of academia, the efficiency of institutions and delivery of services. In Zambia this has been made especially problematic by consistent electricity rationing of homes, businesses and public services and schools. Load shedding can lead to productivity losses for households, businesses, and the local economy according to Bwalya Umar et al, 2022 and because the affect of load shedding transcends to beyond energy supply into national development and institutions Phiri (2025) refers to Zambia's load shedding as economic blackouts.

Load shedding has been especially problematic in the education sector, where ICT based programming, and thus a modern higher education, is highly dependent on electricity availability. All teaching and learning, assessment and student records, communication and research activities must now occur if a stable supply of power is available. The LMS, computer labs, databases of admin info, and online academic services are no longer dependable when the power goes out. Also, Mukanema et al. (2026) link energy poverty to low-quality education and low-quality institutions. Similarly, Malik et al. (2022) note that power instability also affects university students due to decreased time available for studying, increased levels of stress, and limited access to online learning resources. This suggest that load shedding is not only an infrastructural issue, but an academic, administrative, psychological, and equity issue for students and staff.

Power cuts have led universities globally to adopt a variety of coping mechanisms. Some of these have been backup solar generators, offline teaching material, changes to schedules, a blend of online and offline learning, and a redesign of the curriculum. Meah (2010) observes that in Bangladesh institutions relied on alternative energy and backup systems, which often became unviable as fuel and maintenance costs rose. According to Ibrahim et al (2016) students and institutions in Ghana adopted rotating schedules and adjusted academic years to minimize this disruption. As a means to protect students from the negative impact of load shedding, Thembane (2024) reports that South African universities began implementing" blended learning and offline contents and flexible learning". Bangani (2024) similarly references solar powered library systems that allow for continued research where it is possible to do so, in spaces with greater digital capacity.

These two studies highlight both how institutions adapt to instability in electricity, but also many mechanisms of coping are temporary and not forms of structural adaptation. Generators can keep certain operations running but are fuel costs, maintenance issues and limited hours of operation become constraints. Solar systems are sustainably the more appropriate option in theory, but, if the system is poorly sized or underfunded it may not adequately meet institutional energy needs. Schedule adjustments and face-to-face lesson blending can ease short-term disruption but structural challenges around inconsistent provision of electricity remain unaddressed. What the literature tells us, then, is that many institutions are coping but not becoming resilient. This is an important perspective to the present study, as despite NIPA Livingstone Campus' employment of coping strategies such as generators, solar systems, back up ICT systems and coordination of management, the continued disruption through these methods raises questions on their effectivity and sustainability within the institution themselves.

In Zambia, previous research on load shedding has centered on households, small and medium enterprises, and general economic productivity. The coping responses of small businesses, as addressed by Mutambo (2023), can be misaligned in scale with the disruption to business operations that power outages represent. Likewise, Nkhuwa and Silwimba (2025) find that cost as well as a lack of capacity and unreliable supply chains also limit institutions and businesses in Zambia to having back-up systems. Charity and Simon 2023 similarly found that SMEs rely on generators and business reorganization to cope with load shedding, but both solutions contribute to higher costs and lower efficiency. Such studies are helpful as they indicate the role of coping strategies in mitigating the effects of short-term shocks but do not necessarily return operations to normal. But the majority of this research is business oriented and fails to sufficiently capture the experience, design and evaluation of coping mechanisms within the context of public higher learning institutions.

For individual coping measures based on student literature, learners adapt their study schedules; carry power banks; mobilize data; download content on their devices; and move to areas with power. Learners studying from personal devices, with mobile data, and flexibly are also adaptations identified by Phiri et al (2021). Outages also skew the balance between academic work, and impose pressure to students and staff as in the case

of University of the West, as Laher et al (2026) find. Pungwa and Moonasamy (2024) also discovered that South African students, "were unable to study during load shedding as they had no access to electricity, internet connectivity, or other learning materials." These studies matter, in part, because they indicate that coping mechanisms deployed by individual learners are often sufficient to render breakdowns survivable for those learners, but can serve to exacerbate inequality. Students that can afford power banks, mobile data, laptops and alternative spaces for studying are more able to cope than those who have less resources.

There is also a relative gap on the institutional management side of the literature. Most existing research identifies coping mechanisms, but less looks at the processes through which institutions formulate, plan, coordinate, finance, implement and monitor them. Although Zambian universities, for example, Kombe and Mtonga (2021) have made some adaptations, such as having generators, flexible timetables and digital formats, these do not necessarily address the needs of all learners. Indicating missing on the management and implementation side. And though there may be mechanisms of coping at institutions – all cope mechanisms will depend on coordination and funding and maintenance and readiness of staff and preparedness of how to correspond with academic needs. Such coping mechanisms must not only be factored in, but also understood in the strength of their coping mechanisms, whether or not they are sustainable, inclusive and provide institutional continuity.

This leaves open a number of the research gaps that were opened up by the literature reviewed here. The first is a contextual one. Most studies on coping mechanisms have been done in sectors such as households, SMEs, hospitality and the general service industry, with few specifically focused on public higher education in Zambia. This only provides a partial picture of load shedding in those campuses heavily reliant on ICT systems, student databases, academic schedules, administrative portals. The current study seeks to bridge this gap by focusing on the case of NIPA Livingstone Campus, a public higher-learning institution, which is impacted by unstable electricity.

The second is an empirical one. Though the availability of coping mechanisms is highlighted in existing studies, there is not always an assessment of the actual functioning impact of these mechanisms. Many studies, for instance, identify name generators, solar systems, and changes to the schedule, but do not make comparisons between these options. This study provides the missing empirical work, using quantitative data from the structured questionnaire and qualitative data from the key informant interviews assessing the perceived effectiveness of generators, solar, ICT backups and management coordination.

A third is a methodological gap. Much of the existing scholarship engages in either qualitative analysis of experience or quantitative analysis of impact but less of both to the extent required to fully grasp an understanding of the scope of the problem. The purely quantitative form exhibits averages but no institution-specific explanation of institutional forums and practices, while the purely qualitative form presents dense description but offers no measurement. The current study addresses this by utilizing both survey and key informant interviews as a mixed-methods study, adding to the validity of the findings through triangulation.

The fourth is a management and implementation gap. There is also less focus on the institutional leadership that organizes coping, as opposed to what students, families and businesses do during load shedding. This type of coordination management is also important as it involves a decision to adapt academic calendars, to interrupt or prioritize ICT systems, communications not to be return to rapidly restore ICT systems back online. This study seeks to fill this gap by examining both technical strategies like generators and solar systems, as well as administrative strategies like coordination, scheduling, and institutional decision making.

A sustainability gap is the fifth. Certain coping mechanisms can be helpful in providing almost immediate relief but, perhaps, are not a sustainable long-term solution. Fuel and maintenance are required for generators, solar systems need to be adequately invested in and sized, ICT backups require existing infrastructure, and timetable changes can stress students and staff. There are no studies that assess these as viable strategies under repeated scenarios or long hours of load shedding. This sustainability gap is addressed in the present study by investigating whether the coping strategies utilized by the NIPA Livingstone Campus are successful only in the short-term adaptation and management of disturbances or if they present a pathway towards institutional sustainability in the future.

The sixth is an equity gap. The coping strategies of the individual are depicted as a practical response, but this puts students and staff who do not have money for extra devices, data, or space to study, in a precarious position. This implies that it is possible for load shedding to compound inequalities that are already present in access to learning and productivity. By exploring coping practices at both the institutional and individual level, this study hopes to add to understandings of how coping processes may relieve and reproduce contexts of higher education.

Overall, the effects of load shedding on higher education as found in the literature depict various forms of disruption to the academic delivery, ICT systems in jeopardy, administrative lag, limited time for students to study, increased stress and costs of operation increasing. While institutions have managed to "cope", this has been more reactionary, piecemeal, and has financially constrained. The need for a targeted study of coping at NIPA Livingstone Campus has been identified in the review of literature and thus follows. This study, while adding to the existing understanding of the effects of load shedding, seeks to understand the resilience of coping mechanisms and their institutional management in a public higher education context. It could also assist in making investments in renewable energies, hybrid backup systems, more institutional resilience for future electricity blackouts, and even more energy planning.

THEORETICAL FRAMEWORK

This study is framed by Resource Dependence Theory (RDT), which holds that organisations operate in environments where critical resources are controlled externally and are not fully within their control (Pfeffer and Salancik, 1978). Applied to the present context, electricity is an external resource on which the National Institute of Public Administration (NIPA) Livingstone Campus depends for academic delivery, ICT infrastructure, administration, and institutional coordination, but over whose supply the institution has no control. RDT predicts that organisations facing such dependence will adopt strategies of substitution, coordination, and internal adaptation to manage resource uncertainty, without necessarily escaping their underlying dependence on the resource itself. This framework guides the interpretation of the study's findings on institutional and individual coping mechanisms, and is applied in detail to the specific results in the Discussion of Findings below.

METHODOLOGY

The study utilized a descriptive, convergent parallel mixed-methods research design which evaluated the effectiveness of coping mechanisms against experiencing load shedding at the NIPA Livingstone Campus. A descriptive design was suited to the study's goal of providing a systematic description and assessment of coping mechanisms, institutional arrangements, and their efficacy in addressing the dislocations of electricity shortages. The convergent parallel mixed-methods design employed quantitative and qualitative data that were collected and analyzed separately at the same point in time, given equal weight, and combined at the interpretation of findings stage. According to Creswell and Creswell (2018), this type of study "offers the strength of broader knowledge about a particular trend, as it combines numerical trends with the experiences of participants".

The quantitative portion involved using survey style questionnaires to gauge the efficacy of various coping mechanisms from the perspective of survey respondents. Such mechanisms were turning to generators, solar systems, solar lamps, ICT backup systems, coordination of management, and re-timing of classes, especially evening classes for part time students. Participants were presented with a 5-point Likert scale asking the extent to which they agreed these strategies helped to ensure continuity of teaching and other academic and administrative functioning. The qualitative element included semi-structured key informant interviews with institutional leaders and also relevant staff within the institutions, adding depth and context to the challenges, processes of implementation, and experience at the ground level with institutional reactions to electricity outages. The qualitative findings provided context for the quantitative patterns, describing the mechanisms that were found in the study in terms of who was using which coping strategies, and why some mechanisms were more/less effective than others.

Using Yamane's (1964) formula, a target sample of 330 was determined. The final study sample comprised 173 participants: 168 questionnaire respondents and 5 key informant interviewees, representing an achieved response rate of approximately 52.4% of the target sample. Student respondents were selected through simple random sampling from the campus's student register, while lecturers and administrative staff were selected through purposive sampling, as they were directly involved in academic delivery, management, and the institutional decision-making process for responding to load shedding. The questionnaire respondents were drawn from across the different departments of the campus and comprised a mix of students, lecturers, and administrative staff, while the five key informants were drawn from institutional leadership and departmental management. The questionnaire itself was developed by the researchers from themes identified in the reviewed literature, structured around respondent background information and the perceived effectiveness of each coping strategy on a 5-point Likert scale. These multiple participant categories enhanced the study's ability to represent both user and institutional perspectives.

Quantitative data on perceived effectiveness of coping strategies was analyzed using descriptive statistics including frequencies, means and standard deviations. Findings from qualitative interviews were thematically analyzed following a structured process of transcription, familiarisation with the data, manual coding of recurring ideas, and grouping of codes into broader themes, including generator dependency, the limitations of solar energy systems, ICT disruption, solar lamps, and scheduling classes based on electricity outages. The integration of the quantitative and qualitative findings, achieved by comparing patterns across both data sets at the interpretation stage, delivered a comprehensive assessment of coping mechanisms and institutional resilience in the NIPA Livingstone Campus.

The integrity of the research process was maintained in an ethical manner. All participants had given informed consent prior to their participation, participation was completely voluntary, and confidentiality and anonymity were guaranteed in the collection and reporting of the data. Pre-testing of the questionnaires helped to ensure reliability by correcting potential ambiguities, while validity was ensured by having experts review the instruments and by triangulating quantitative with qualitative data. This process ensured that the data collected on coping strategies and institutional responses to load shedding in Zambian higher education was reliable, valid and ethical.

DISCUSSION OF FINDINGS

Overview of Findings

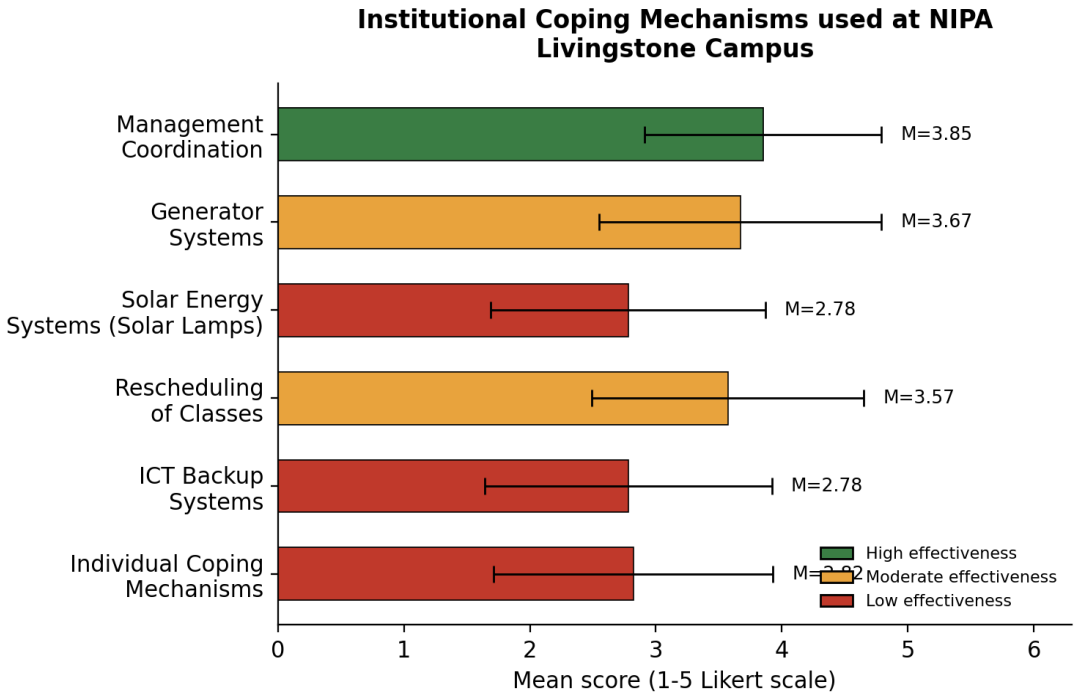
It speaks to the findings as to what some of the coping mechanisms have been at the National Institute of Public Administration (NIPA) Livingstone Campus in order to mitigate the effects of load shedding. This study is revealing in a sense that it demonstrates some of the coping mechanisms, at an institutional and individual level, that the university has adopted, but these are only stop-gap interventions and insufficient to ensure that academics in particular and administration in general can run smoothly. Also, coping management coordination was found to be the most efficient of all coping strategies with a mean score of 3.85, followed by generator systems as the next effective strategy with a 3.67 mean score, and the rescheduling of classes with a 3.57 mean score, while ICT backup systems and solar energy systems received lower scores of effectiveness at 2.78 each. From this, coping strategies are developed, but there is very little that the coping strategies can actually do to alleviate the structural dead-end represented by instability in electricity.

It is concluded that NIPA Livingstone Campus as well as the majority of higher learning institutions operating in an environment limited by energy have developed measures to adapt and cope but not necessarily become resolved. Electricity outages continue to affect and disrupt ICT- related studies, administration, communication, and ongoing learning. This is consistent with broader data that finds load shedding to be generally productive, effecting the efficiency and service delivery of institutions more broadly in Zambia and across Africa (Bwalya Umar et al. 2022; Phiri 2025). The results are also in support of Mukanema et al. (2026) which highlighted that energy insecure schools negatively impact the quality of teaching, access to learning resources and the school functioning as a whole.

Institutional Coping Mechanisms

In terms of institutional impact, the influence of unstable electricity supply is significant for the academic offering, ICT systems as well as administrative functions at NIPA Livingstone Campus. The institution had to adapt technologically as well as administratively to this by using various generators, solar systems (solar lamps), ICT backups and management coordinating, individual coping mechanism and rescheduling the academic calendar. As for the quantitative outcomes, the most successful institutional response was the management coordination response, showing that human- focused adaptive strategies have present potential to be more operationally useful than some tech-based responses.

Figure 1: Institutional Coping Mechanisms used at NIPA Livingstone Campus



The findings presented in Figure 1 show perceived effectiveness of five distinct coping mechanisms based on their mean scores and standard deviations (SD). Management Coordination emerged as the most successful strategy, achieving the highest mean score of 3.85(SD = 0.94), which classifies it as having High Effectiveness. In contrast, both Generator Systems (Mean = 3.67, SD = 1.12) and the Rescheduling of Classes (Mean = 3.57, SD = 1.08) demonstrated Moderate Effectiveness, indicating they serve as relatively reliable but imperfect fallback options. The least successful strategies were Solar Energy Systems and ICT Backup Systems, both tying for the lowest mean score of 2.78 (with SDs of 1.09 and 1.14, respectively) and falling under the Low Effectiveness category. Overall, the data reveals that structured administrative interventions, such as management coordination, are viewed as significantly more effective than technical or infrastructure-dependent workarounds like solar and ICT backups, which also showed higher variability in responses as indicated by their larger standard deviations.

Good coordination of management provides a clear example of the importance of institutional flexibility in moments of uncertainty. Minor adjustments to the calendar, like rearranging activities, informing of power outages, giving priority to essential services, and changing mid-term classes for students studying part- time, have permitted the institution to continue to function in a somewhat ‘normal’ academic way. But these are still reactive, relying heavily on short term fixes rather than moving away from an unreliable supply of electricity.

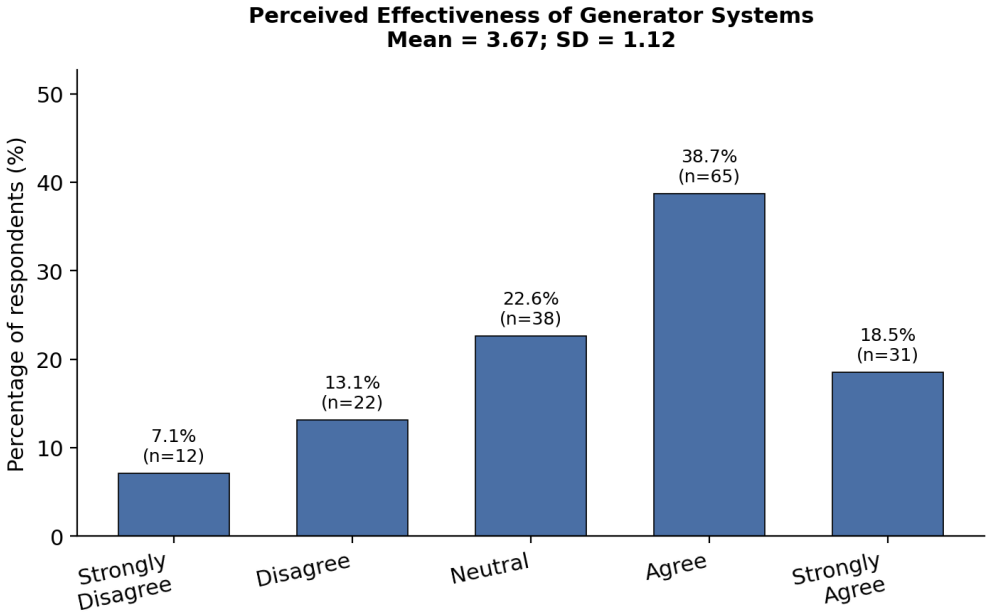
This is consistent with broader evidence of educational disruption from energy instability, affecting classroom schedules, online resources, and administration more broadly (Mukanema et al. 2026). Similarly, load shedding in universities, as Thembane (2024) has discovered, is done through flexible mechanisms that don’t entirely restore the functioning of the university in the normal sense. Though a form of institutional coordination

providing temporary resilience, it must be understood as an adaptation, but not a resolution, to the energy crisis more fundamentally.

Effectiveness of Generator Systems

The findings of the study find that generator systems are the most commonly used institutional strategy for coping with power outages, that has had a moderate level of success in allowing the NIPA Livingstone Campus to maintain operations and continuity during outages. But they are heavily limited by these operational issues – no fuel, cost prohibitive to maintain, limited run-time.

Figure 2: Perceived Effectiveness of Generator Systems



Mean = 3.67; Standard Deviation = 1.12

Figure 2 shows a generally positive view of generator systems: 57.2% of respondents agreed or strongly agreed (38.7% Agree, n = 65; 18.5% Strongly Agree, n = 31), 22.6% were neutral (n = 38), and 20.2% disagreed or strongly disagreed (13.1%, n = 22; 7.1%, n = 12). The balance of opinion favours agreement, though nearly a quarter of respondents remained undecided.

The mean score of 3.67 indicates a moderate level of effectiveness, implying that generator systems provided critical support during electricity interruptions, particularly for sustaining key institutional operations and administrative processes. However, respondents acknowledged that generator systems have notable limitations because their operation is heavily constrained by high fuel costs, recurring maintenance demands, and the fact that they generally offer a temporary fix rather than a seamless solution for prolonged power outages. Consequently, while the generators successfully mitigated the immediate impact of load shedding and allowed core activities to continue, they could not fully alleviate the broader, long-term challenges of electricity instability.

These findings are in line with the evidence collected with SMEs and institutions in Zambia that basically, while generators are important for keeping business afloat in the short term, they are financially and operationally unsustainable in the long run (Nkhuwa and Silwimba, 2025). Another study of SMEs identified the high cost of operations, and decreased efficiency of business operations where reliance on generators was involved, similar to the findings in this case where regular load shedding was also a not uncommon feature (Charity and Simon, 2023).

In line with this, small scale enterprises have also found reliance on generator systems to be both a financial drain and instability as an operation, as it must deal with varying prices of fuel and inconsistent supply of fuel

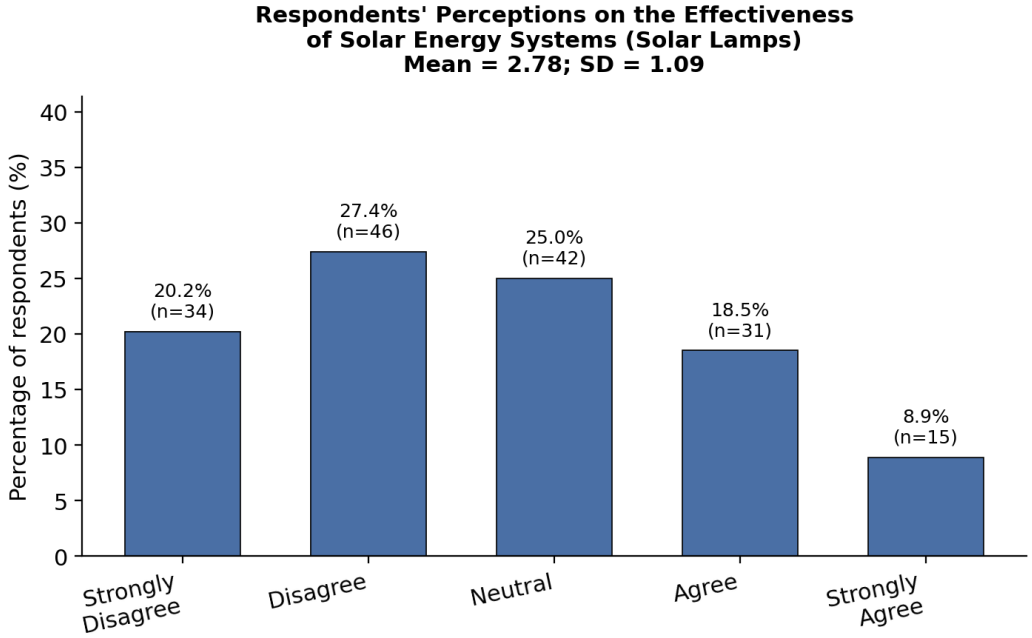
(Kintu, 2022). This implies that while generators could be of use in times of crisis, they are not solutions to the institutional energy crisis but temporary fix within that crisis.

More broadly, the same patterns can be seen in other African institutional contexts, in which backup power systems are ubiquitous, but do not solve the systemic reliance on unreliable electricity (Tembe and Hlengwa, 2022).

Effectiveness of Solar Energy Systems (Solar Lamps)

The solar energy system introduced during load shedding at NIPA Livingstone Campus was primarily the use of solar lamps to support evening classes and provide basic lighting during electricity interruptions. The intervention was intended to enable students and staff to continue with selected academic and administrative activities when normal electricity supply was unavailable. Respondents were therefore asked to indicate the extent to which they agreed that solar lamps were effective in reducing the effects of load shedding.

Figure 3: Respondents' Perceptions on the Effectiveness of Solar Energy Systems (Solar Lamps)



Mean = 2.78 Standard Deviation = 1.09

Figure 3 shows a predominantly negative view of solar lamps: 47.6% of respondents disagreed or strongly disagreed (27.4% Disagree, n = 46; 20.2% Strongly Disagree, n = 34), 25.0% were neutral (n = 42), and only 27.4% agreed or strongly agreed (18.5%, n = 31; 8.9%, n = 15). The balance of opinion leans toward disagreement.

The mean score of 2.78 indicates a low level of effectiveness, implying that solar lamps provided limited support during electricity interruptions, particularly for evening classes, individual reading, and basic office activities. However, respondents acknowledged that solar lamps have significant limitations because they provide only lighting and cannot support critical ICT-based operations such as computers, internet connectivity, printers, projectors, and laboratory equipment. Consequently, although the lamps slightly improved visibility and allowed limited continuation of activities, they could not replace the broader electricity requirements of a higher education institution.

Qualitative findings supported the quantitative results, as key informants indicated that solar lamps were useful as a temporary coping mechanism but were insufficient for maintaining normal institutional operations during prolonged power outages. Respondents emphasized that modern teaching and administrative activities increasingly depend on electricity-driven technologies, making lighting solutions alone inadequate for ensuring full academic continuity.

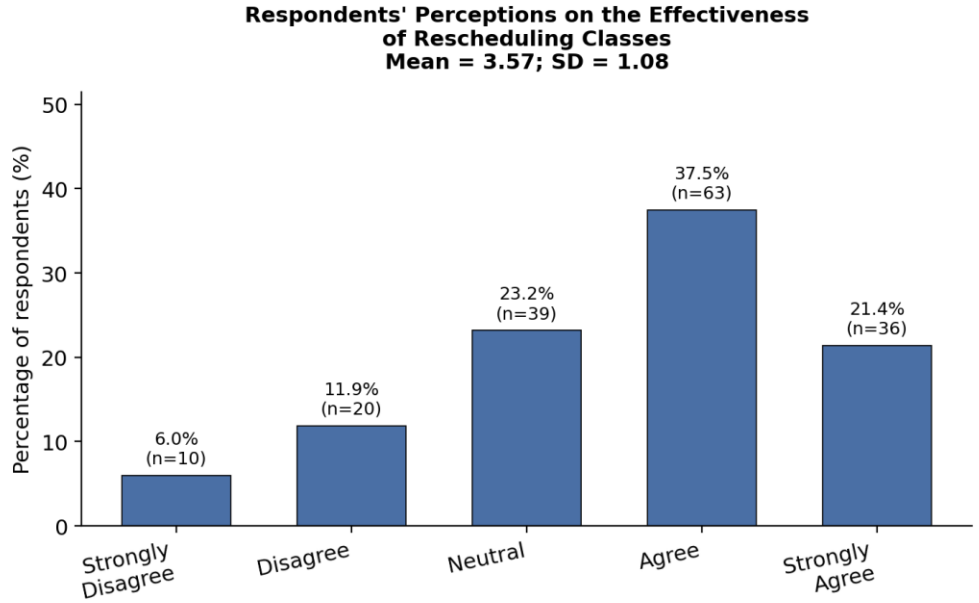
These findings are consistent with Alisinda and Chisumbe (2026), who argue that small-scale renewable energy interventions can improve institutional resilience but should be viewed as complementary measures rather than complete replacements for conventional electricity supply. Similarly, Malik et al. (2022) observed that alternative lighting technologies can improve learning conditions during power interruptions but do not address the wider energy requirements of higher education institutions.

Overall, the findings show that solar lamps have made a positive but limited contribution to reducing the effects of load shedding at NIPA Livingstone Campus. While they have supported evening classes and basic activities during electricity interruptions, their effectiveness remains constrained by their inability to power essential academic and administrative technologies. Therefore, solar lamps should be considered part of a broader energy management strategy rather than a standalone solution to institutional electricity challenges.

Effectiveness of Rescheduling Classes

One of the coping mechanisms introduced at NIPA Livingstone Campus during periods of load shedding was the rescheduling of classes to alternative times when electricity supply was available. This strategy was intended to minimize disruptions to teaching and learning activities by allowing lecturers and students to continue with planned academic programmes despite power interruptions. Respondents were therefore asked to indicate the extent to which they agreed that rescheduling classes was an effective measure in reducing the impact of load shedding.

Figure 4: Respondents' Perceptions on the Effectiveness of Rescheduling Classes



Mean = 3.57 Standard Deviation = 1.08

Figure 4 shows that respondents generally viewed the rescheduling of classes as effective: 58.9% agreed or strongly agreed that adjusted schedules reduced academic disruption, 17.9% disagreed or strongly disagreed, and 23.2% were neutral, suggesting effectiveness varied with individual circumstances and the availability of alternative time slots.

The mean score of 3.57 indicates a relatively positive perception of the effectiveness of rescheduling classes, suggesting that respondents considered the strategy useful in maintaining continuity of teaching and learning during periods of power interruptions. The standard deviation of 1.08 reflects moderate variation in responses, showing that while many respondents benefited from the adjustment of class schedules, others experienced challenges related to availability, convenience, and academic workload management.

Qualitative findings supported the quantitative results, with respondents indicating that rescheduling classes

allowed lecturers to complete planned lessons and reduced the number of missed learning sessions during load shedding. However, some respondents highlighted limitations associated with this approach, including difficulties in accommodating students and lecturers' availability, disruption of personal schedules, and challenges in conducting evening classes when alternative power sources were unavailable.

Overall, the findings demonstrate that rescheduling classes was one of the more effective short-term coping mechanisms implemented at NIPA Livingstone Campus. Unlike measures that only provide limited support, such as solar lamps, adjusting class schedules directly addressed the disruption of teaching activities by creating opportunities for learning to continue when electricity was available. However, the strategy remains dependent on the availability of alternative time slots and cannot fully eliminate the broader challenges associated with prolonged electricity shortages. Therefore, while rescheduling classes improves academic continuity, it should be supported by more reliable energy solutions to ensure uninterrupted teaching and learning.

ICT System Disruptions

The findings demonstrate that ICT infrastructure represents one of the most vulnerable areas affected by electricity instability at NIPA Livingstone Campus. Modern institutional activities, including learning management systems, student portals, examination databases, and administrative information systems, rely heavily on a stable electricity supply. Consequently, power interruptions frequently affect digital learning, communication, data management, and administrative processes.

Respondents were therefore asked to indicate the extent to which they perceived ICT backup systems as effective in reducing disruptions caused by load shedding.

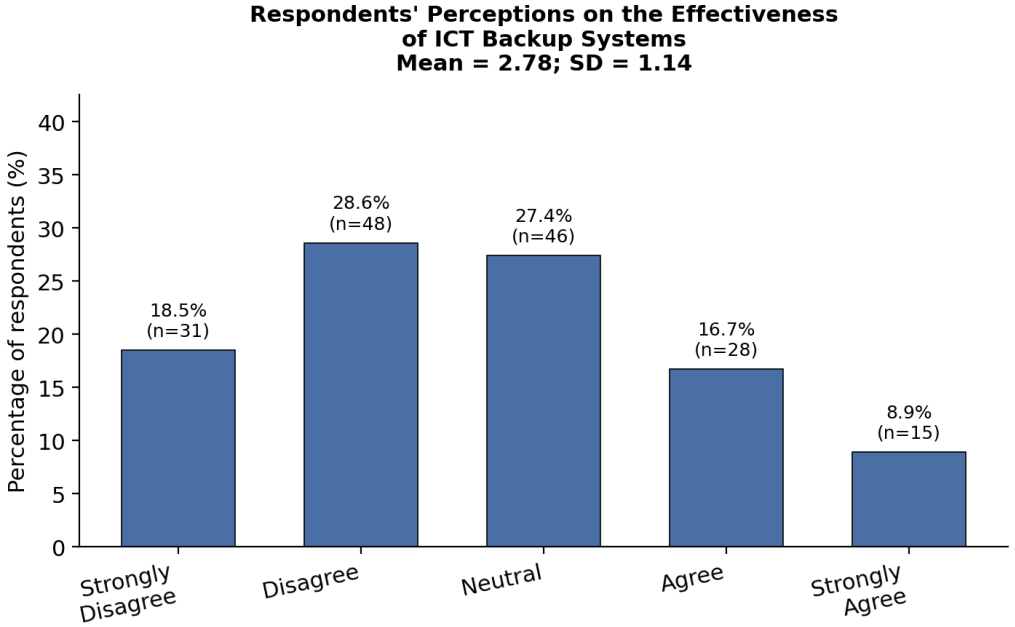


Figure 5: Respondents' Perceptions on the Effectiveness of ICT Backup Systems

Mean = 2.78 Standard Deviation = 1.14

Figure 5 indicates limited confidence in ICT backup systems: 47.1% of respondents disagreed or strongly disagreed (28.6%, n = 48; 18.5%, n = 31), 27.4% were neutral (n = 46), and only 25.6% agreed or strongly agreed (16.7%, n = 28; 8.9%, n = 15). This suggests that, absent more robust infrastructure and systemic redundancy, existing ICT backups did not reliably sustain academic and administrative operations during outages.

The mean score of 2.78 suggests that respondents generally viewed the existing ICT backup mechanisms as insufficient to fully maintain digital operations during periods of load shedding. Although backup systems

provide some level of support, their effectiveness is constrained by limited capacity, maintenance challenges, and continued dependence on electricity availability.

Qualitative findings further revealed that ICT-related disruptions affected several institutional functions, including access to online learning platforms, administrative information systems, communication channels, and digital academic resources. Respondents indicated that during prolonged power outages, interruptions to ICT services affected teaching preparation, access to learning materials, submission of academic work, and administrative efficiency.

These findings are consistent with Laher et al. (2026), who established that electricity interruptions negatively affect ICT-dependent learning environments by limiting access to academic resources, disrupting workload management, and increasing pressure among students and staff. Similarly, Mukanema et al. (2026) found that educational institutions relying heavily on digital systems are among the first to experience operational disruptions when energy supply becomes unreliable.

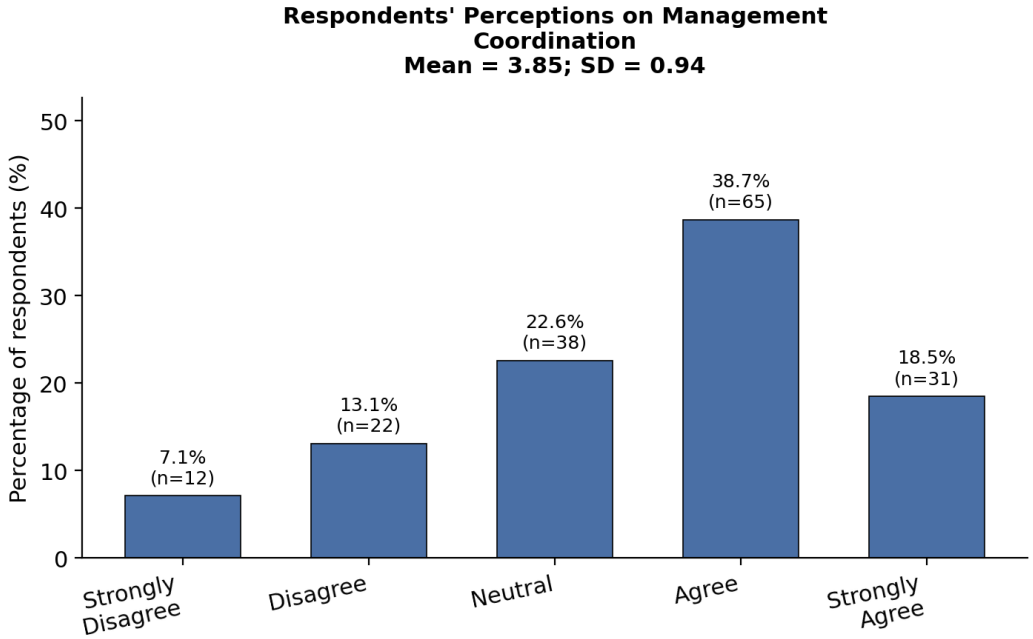
Further, Alisinda and Chisumbe (2026) highlight that institutions require adequate backup infrastructure, including reliable power protection systems and alternative energy solutions, to improve resilience against electricity instability. The current findings at NIPA Livingstone Campus reflect this situation, as existing ICT backup arrangements provide only partial protection and cannot completely prevent service interruptions during extended load shedding periods.

Overall, the findings demonstrate that while ICT systems have improved institutional efficiency, academic accessibility, and communication, they have also increased dependence on reliable electricity supply. Therefore, improving ICT resilience requires investment in stronger backup power systems, increased renewable energy capacity, regular maintenance of ICT infrastructure, and integrated institutional energy planning to ensure continuity of academic and administrative operations during load shedding.

Management Coordination

Coordination of management ranked as the best coping strategy among all NIPA Livingstone Campus students coping strategies. The breakdown of responses regarding its perceived role and implementation is summarized in the figure below:

Figure 6: Respondents' Perceptions on the Management Coordination



Mean = 3.85 Standard Deviation = 0.94

Figure 6 shows the distribution of respondents' agreement levels regarding the effectiveness of management coordination as a coping strategy. It is evident from the data that the majority of the participants expressed a positive sentiment, with 38.7% (n = 65) selecting Agree and 18.5% (n = 31) choosing Strongly Agree, culminating in a combined agreement rate of 57.2%. A notable portion of the sample remained undecided, as 22.6% (n = 38) of the respondents fell into the Neutral category. Conversely, negative responses were in the minority, with 13.1% (n = 22) of the participants indicating Disagree and only 7.1% (n = 12) opting for Strongly Disagree, representing a combined disagreement rate of 20.2%. Overall, these findings indicate that while nearly a quarter of the sample maintained a neutral stance, the general consensus among the respondents heavily leans toward agreement.

The mean score of 3.85 indicates a high level of effectiveness, implying that management coordination provided significant support during electricity interruptions, particularly for dynamically altering work schedules, redistributing workloads, and optimizing intra-institutional communication. However, respondents acknowledged that administrative coordination has its limitations because it operates as a reactive strategy rather than a structural solution, meaning it cannot resolve the underlying infrastructural deficits or the long-term dependencies on external power sources. Consequently, while management flexibility successfully mitigated the immediate disruptions of load shedding and kept core institutional processes viable, it serves as a temporary, stop-gap intervention rather than a permanent fix to electricity instability.

The strategies employed by these institutions in response to the disruptions created by the electricity included: altering work schedules, altering workloads, pausing non-essential programs temporarily, and better intra-institutional communications strategies.

This provides insight into how much administrative flexibility is significant to remain a viable institution when the electricity is erratic. Unlike technological adaptations, coordination in management is made possible by human flexibility and discretion, which allow institutions to adjust their operations in the moment based on whether electricity is available or not.

Key informants explained that the effectiveness of these practices stemmed from specific operational steps rather than from schedule changes alone. Altering work schedules involved shifting lecture and examination timetables to periods of confirmed electricity availability, informed by published load-shedding schedules from the national utility. Redistributing workloads meant temporarily reassigning administrative duties to staff working from locations with power, so that time-sensitive tasks such as student registration and results processing were not entirely halted. Pausing non-essential programmes, such as optional workshops and non-critical meetings, freed up available power and staff time for core academic and examination-related activities. Improved intra-institutional communication, largely through phone calls and instant messaging platforms, allowed departments to alert one another promptly when power was restored or about to be interrupted, enabling a coordinated response rather than each department reacting independently. It was this combination of advance warning, prioritisation of critical functions, and cross-departmental communication, rather than any single practice on its own, that respondents identified as the basis for management coordination's comparatively higher effectiveness rating.

But the preventive role, though limited, is even less than functional role. Institutions respond to these shocks instead of preempting and predicting energy-related risks. This means that external coordination is only limited to temporal and not to structural results, as it helps resilience in the sense of being only temporary, but not on the structural inefficiencies created by the dependency on external resources.

This comment aligns with institutional studies noting that while administrative flexibility may leave some room for maneuver, it doesn't necessarily remove the limitations of existing infrastructure (Tembe and Hlengwa, 2022). Similarly, those institutions that rely on a reactive timetable and coordination also remain dysfunctional as a result of continued instability of energy.

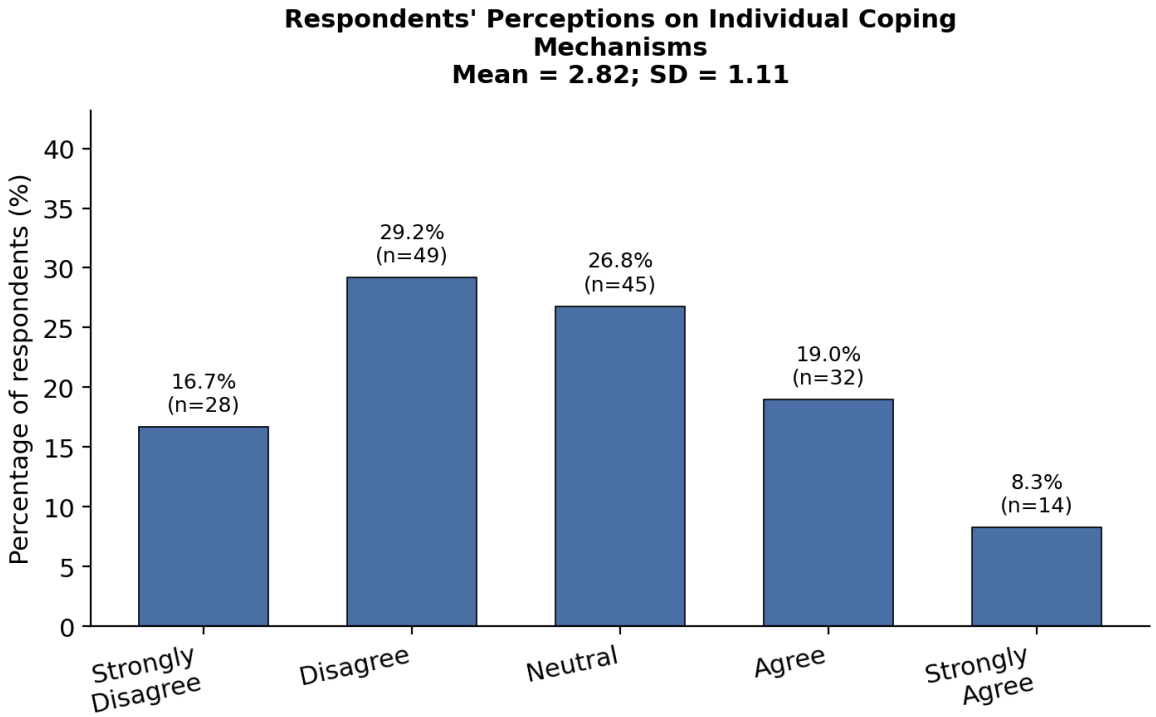
Studies in service industry sectors indicate how adaptations based on humans outperform technological systems under conditions of uncertainty regarding the resource. But this is only temporary and not sustainable because they depend on day-to-day management rather than an established infrastructure (Nkhuwa and

Silwimba 2025). Therefore, while coordination of management is the most efficient coping mechanism in the short term it does not serve as a viable long-term response to the reality of load shedding.

Individual Coping Mechanisms

At a micro-level, students as well as staff have individual coping mechanisms in the face of the impact of load shedding. Such as mobile phones, power banks, study materials offline and timing of study flexibly. These practices help people preserve some level of academic and administrative function, though this is interrupted by outages.

Figure 7: Respondents' Perceptions on the Individual Coping Mechanisms



Mean = 2.82 Standard Deviation = 1.11

Figure 7 shows a predominantly negative view of individual coping mechanisms: 45.9% of respondents disagreed or strongly disagreed (29.2%, n = 49; 16.7%, n = 28), 26.8% were neutral (n = 45), and only 27.3% agreed or strongly agreed (19.0%, n = 32; 8.3%, n = 14). The balance of opinion leans toward disagreement.

The mean score of 2.82 indicates a low level of effectiveness, implying that individual coping mechanisms provided limited support during electricity interruptions, particularly for mitigating academic and administrative disruptions. However, respondents acknowledged that these strategies have significant limitations because personal devices like power banks and mobile data are costly and depend entirely on an individual's financial capacity. Consequently, although these practices allowed a small minority to maintain basic functions temporarily, they could not replace the broader infrastructure needed to ensure that learning and administration could run smoothly across the institution.

The study finds but that these coping mechanisms produce significant levels of inequality for students and staff. Alternative energy solutions and backup digital devices are not uniformly available, thus experiences of learning and productivity during load shedding are not uniform.

This suggests a trend in literature indicating how, in situations of electric deprivation, individual coping mechanisms are likely to reinforce existing inequalities, particularly regarding access to education and digital learning (Malik et al., 2022). That is to say, if students cannot afford to have an additional device available, they are the most affected, with less time for studying and less resources available.

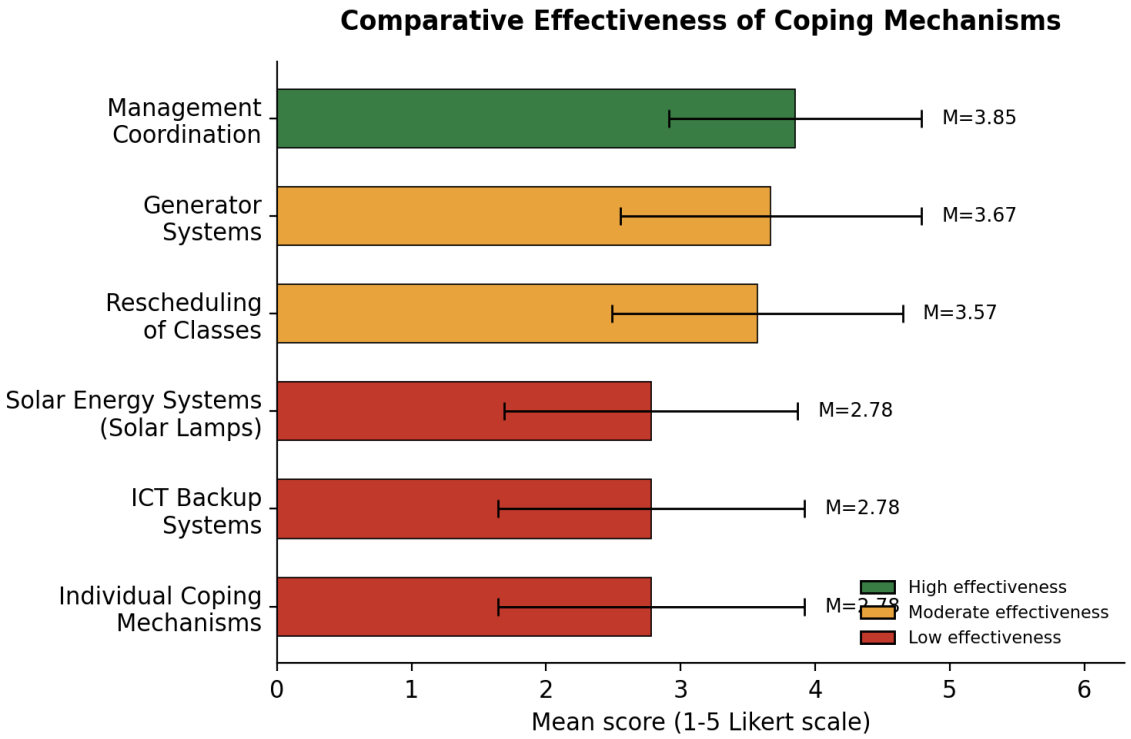
Likewise, Thembane (2024) finds that loadshedding increases students' sense of academic pressure, as well as decreases students' academic performance and academic capacity to cope with workload. This is especially an issue in a fully digitized learning environment and where having electricity specifically to do school work is a prerequisite.

Other examples from higher education show that while individual coping can be a short-term solution for particular students, it does not address or challenge the power imbalances or structural constraints at play in the institutional context. Rather, they tend to displace the ability to adapt as each individual's, rather than as a process that is dealt at the level of the institution which is strained for energy. Individual coping strategies can be seen as semi survival strategies that keep an individual limping along but not providing a fair or long-term solution to the problem of load shedding.

COMPARATIVE EFFECTIVENESS OF COPING MECHANISMS

In terms of coping strategies at NIPA Livingstone Campus, there is much variation in the effectiveness of various strategies in ameliorating the effects of load shedding. As summarized in Figure 2, management coordination had the highest mean score at M = 3.85, SD = 0.94), followed by generator systems at M = 3.67 SD = 1.12), and rescheduling of classes at M = 3.57 (SD = 1.08). Conversely, both solar energy systems (SD = 1.09$) and ICT backup systems (SD = 1.14) had the lowest means, both tying at M = 2.78.

FIGURE 8: Comparative Effectiveness of Coping Mechanisms



From a comparative analysis figure 8 implies that non-technical coping mechanisms, in particular management coordination and administrative adaptations like rescheduling classes, are more likely to make institutions resilient to load shedding as opposed to those coping mechanisms which are strictly technology-based. The ability of institutions to adapt, human decision making and ultimately flexibility arguably all become more important than perhaps more recent interventions around infrastructure as a solution to the challenge of electricity interruptions.

Management coordination was the best mechanism because it could most rapidly change how the institution operated, by changing schedules, redistributing work and re-organizing communication. This ability to remain flexible is what allows the organization to maintain some semblance of stability amidst unstable power outages.

Technological coping solutions such as generators, and ICT and solar energy systems were also shown to be not as effective given their structural limitations and how they operated. Sometimes, diesel powered generator systems became a more common application, but again are constrained by fuel costs, maintenance concerns, as well as only providing a reliable electricity supply on a temporary basis and thus also make for an unreliable solution for long-term outages (Nkhuwa and Silwimba, 2025). Solar systems, likewise, are not over-capacitized, and cannot supply power for high-capacity institutional infrastructure such as ICT laboratories, and administrative servers, another problem with many other electricity dependent institutions (Alisinda and Chisumbe, 2026).

Due to a lack of backup infrastructure, and redundancy systems, ICT systems that support academic and administrative processes have been significantly exposed to load shedding. This results in a lack of learning platforms, student data bases and administrative work which compounds the low effectiveness score that the study shows.

Such patterns conform with both more general studies within Zambia and within similar contexts, which indicate that weak or unreliable technological infrastructures foster within institutions dependencies on adaptive human systems. In these contexts, the flexible role of the manager acts in-lieu-of infrastructure with resilience (Tembe and Hlengwa 2022, Phiri 2025).

The comparison exposes a key gap, between flexibility and capacity on the institutional side of infrastructure – revealing that these coping mechanisms are more reactive than transformative to energy instability.

THEORETICAL INTERPRETATION OF FINDINGS: A RESOURCE DEPENDENCE THEORY PERSPECTIVE

Resource Dependence Theory, that "recognizes that organizations operate in environments where resources are controlled by other organizations and are not completely within their control," is a powerful explanation for the implications of this study's findings. For the NIPA Livingstone Campus, electricity is an external resource that is crucial to the academic delivery, ICT infrastructure, administration, and coordination of the institution. Load shedding is common, the manifestation of the precariousness in depending upon an outside energy source that is not reliable. Thus, disruptions to the organization are not just logistical problems but crises in resource certainty, which as RDT tells us is a key limitation on stability and performance.

Among its findings, the study finds that NIPA Livingstone Campus has employed a number of strategies in the face of the effects of a reliance on electricity. These have included generator systems, solar energy systems (solar lamps), ICT backup systems, coordinating management, and rescheduling classes such as evening classes for part time students. Substitutions, which are employed for RDT, these sorts of strategies are firms attempting to reduce uncertainty, secure important functions or activities, or create continuity in an important resource's unreliability. But, these mechanisms are not able to replace the need of plugging in the national grid, but rather make it possible for the institution to operate in a limited capacity while relying on the grid.

That management coordination was the highest scored capability (M =3.85) is consistent with the RDT view of organizations responding to resource contingencies by developing internal capabilities to adapt. NIPA has become operationally adept at changing school hours, reorienting institutional work/activities, deciding which services are most important, and communicating more effectively when the lights go out. But, this adaptation is a form of 'adaptive resilience', not 'structural independence' as the institution is still reliant on outside electricity of course.

Similarly, the slight utility of generator systems (M=3.67) is the institution trying to deal with resource uncertainty by having a back-up source of supply. In line with the RDT perspective, generators are seen as a form of resource substitution, where organizations try to maximize access to key resources in order to minimize their vulnerability. But, reliance on generators, and the fuel costs, maintenance problems, and inability to run everything on them, also shows that this is only a limited independence. The institution is still at the mercy of an external market for fuel, both in terms of availability and price.

Similarly, the low performance ratings of solar systems and ICT backups (M=2.78 each) are in line with RDT arguments of never fully escaping the environment, but rather partially so via a minimum resource capacity. Solar energy systems and ICT backup, in the use of attempts to diversify the resource base, are not able to fully replace grid electricity. Individual and some institutional activities can be sustained with solar lamps, but not ICT labs, administrative servers, or the multimedia content of digital learning platforms. These measures can then be seen as providing some relief from vulnerability, but do not transform the institution's connection to the energy environment beyond itself.

An important aspect of RDT that this situation points out is that, even when organizations develop strategies to cope with uncertainty, they cannot always eliminate dependence on resources critical to their operations that are found in the environment, such as ICT systems or classes that run in themselves. Reactions to disruptions at the NIPA Livingstone Campus, but, indicate that these reactions are largely reactive and premised on maintaining functioning in a moment of disruption rather than attempting to avoid the disruption itself. This corroborates with Nkhuwa and Silwimba (2025) whose findings indicate that coping strategies within organizations subjected to electrical instability only minimize short-term losses and do not solve underlying structural weaknesses.

These findings further corroborate Phiri (2025) when he states that electricity rationing is a bigger structural problem with economic and institutional implications beyond the power of organizations to fix in Zambia. Applying RDT, this implies that institutions can enhance their internal capacities, but their resilience remains incomplete as long as the external resource environment is unstable. So NIPA's experience is more reflective of a tendency in education and elsewhere where these types of organizations are still transitioning and adapting to being resource-poor but not really transitioning to the extent of fully becoming themselves and fully de-coupling and de-linking from external systems.

In this sense the theory developed in this study is that resilience at NIPA Livingstone Campus is adaptive, not transformative. The institution has created some mechanisms to allow for the functioning during a time of electrical outage, but still remains dependent on faulty electricity. The findings therefore confirm the Resource Dependence Theory position that organizations facing precariousness of a key resource rely on adaptation, coordination and/or expansion as coping measures, but longer-term survival can also require more fundamental structural change. Long term, sustainable resilience for NIPA Livingstone Campus, and other institutions of higher education in Zambia, will require reliance on consistent, renewable energy sources, hybrid approaches, and energy planning that does not rely on an erratic supply of electricity from external sources.

LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH

This study is not without limitations. First, the research was based on a single case study of the NIPA Livingstone Campus, which limits the extent to which the findings can be generalised to other public higher education institutions in Zambia, whose energy contexts, infrastructure, and coping arrangements may differ. Second, the study relied on respondents' self-reported perceptions of the effectiveness of coping mechanisms rather than on objective performance indicators, such as the duration of electricity outages, operational downtime, the financial cost of coping mechanisms, the reliability of backup systems, or measurable changes in academic productivity; incorporating such indicators in future studies would strengthen the empirical basis for comparing coping mechanisms. Future research should therefore extend this line of enquiry to multiple higher education institutions across different regions of Zambia, combining perception-based measures with objective performance indicators, to improve the generalisability and empirical strength of findings on institutional coping with load shedding in the higher education sector.

CONCLUSION

This study concludes that coping mechanisms employed at NIPA Livingstone Campus including generators, solar systems, ICT backups, and management coordination offer only temporary, reactive relief rather than sustainable solutions to the structural challenge of load shedding. While management coordination emerged as the most adaptive human-centered strategy, it remains a response to disruption rather than its prevention, reflecting broader institutional tendencies to work around resource instability without addressing its root

causes. The findings substantiate Resource Dependence Theory, illustrating how institutional performance remains precariously tied to an unreliable external electricity supply, with disruptions permeating ICT systems, academic delivery, and administrative functions. Personal coping strategies adopted by students and staff, such as mobile devices and power banks, further reveal inequities in adaptive capacity. Ultimately, the study argues that without strategic investment in sustainable energy infrastructure and hybrid systems, Zambian higher education institutions will remain in a perpetual state of crisis, unable to achieve operational efficiency and service delivery excellence.

REFERENCES

1. Alisinda, M. M., and Chisumbe, S. (2026*). Sustainability of coping strategies among electricity dependent SMEs during load shedding: Evidence from welding enterprises in Lusaka,* Zambia. African Journal of Commercial Studies, 7(3), 200–205.
2. Bangani, S. (2024). *"Librarying" under the candlelight: The impact of electricity power outages on library services.* Open Information Science, 8(1), 20240008. https://doi.org/10.1515/opis-2024-0008
3. Bwalya Umar, B., Chisola, M. N., Mushili, B. M., Kunda-Wamuwi, C. F., Kafwamba, D., Membele, G., and Imasiku, E. N. (2022). *Load-shedding in Kitwe, Zambia: Effects and implications on household and local economies*. Development Southern Africa, 39(3), 354–371.
4. Charity, L., and Simon, T. (2023). *Load shedding and coping business mechanisms of SMEs: Case of female entrepreneurs in Lusaka Kabwata Market*. Management, 13(1), 15–20.
5. Chirwa, K., and Chilufya, R. (2024). *Illuminating insecurity: Effects of load-shedding on personal security in Chimwemwe ward*, Kitwe, Zambia. MU Journal, 5(2), 104–115.
6. Creswell, J. W., and Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). Sage Publications.
7. Ibrahim, A., Aryeetey, G. C., Asampong, E., Dwomoh, D., and Nonvignon, J. (2016). *Erratic electricity supply (Dumsor) and anxiety disorders among university students in Ghana: A cross-sectional study*. International Journal of Mental Health Systems, 10, Article 17. https://doi.org/10.1186/s13033-016-0053-y
8. Kabili, A. N., Kabwe, J. C., Kumwenda, A., Kasonkomona, P. C., Mwila, G., and Lubeya, M. K. (2022). *Online learning during the COVID-19 pandemic: A qualitative study among final year medical students at the University of Zambia*. F1000Research, 11, 1363.
9. Kambili, M., Bwalya, C., Mbewe, J., Mweemba, M., Nkweto, E., Phiri, C. J., et al. (2026). *Impact of load shedding on fresh fish suppliers and consumers in Chinsali District, Zambia. Aquaculture, Fish and Fisheries*, 6(2), e70246.
10. Kintu, M. (2022). *The effects of load shedding on the viability of small and medium enterprises in Chainda compound* (Doctoral dissertation, The University of Zambia).
11. Kombe, C., and Mtonga, C. (2021). *Loadshedding and its effects on students' anxiety: Evidence from Zambian universities.* [Details as cited in secondary literature; authors should verify original source and full bibliographic details before submission.]
12. Laher, Z., Badat, A., Gathoo, A., Notoria, M. M., Cachalia, M. E., & Sardiwalla, Z. M. (2026). *Assessing the implications of load shedding on academic workload management by preclinical MBChB students*. *Futurity Education, 6*(1), 198–216.
13. 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. Anxiety*, 59(41), 0–33.
14. Meah, K., Sadrul Ula, A. H. M., Kearns, J., and Vaisakh, K. (2010). *Short- and medium-term solutions for the current electricity crisis in Bangladesh.* IEEE PES General Meeting, Minneapolis, MN, USA (pp. 1–8). IEEE. https://doi.org/10.1109/PES.2010.5589477
15. Mukanema, M., Simate, I. N., and Mbimbi, S. (2026). *Impact of energy poverty on provision of quality education: Evidence from selected schools in urban Zambia*. Journal of Education and Learning (JEL), 5(1), 1–15.
16. Mutambo, H. (2023). *Assessing the impact of load shedding and coping strategies on business operations of small-scale enterprises: Masala Market in Ndola*, Zambia (Doctoral dissertation, ZCAS University).
17. Pfeffer, J., and Salancik, G. R. (1978). *The External Control of Organizations: A Resource*

Dependence Perspective. Harper and Row.

18. Nkhuwa, H., and Silwimba, P. (2025). *Examining the effects of load shedding on the operational performance of SMEs: A case study of Zambia.* Journal of Economics, Business, and Commerce, 2(2), 158–169.
19. Phiri, C., Mpundu, G., Chama, E., Ngandu, M., Mwanza, E. L., Aluckal, E., Peediackel, A. G., Sebastian, A., Gera, M., and Mohan, N. (2021). *An assessment of the impact of electricity power outages on university students' life, Lusaka, Zambia.* Canadian Journal of Health Research, 1.
20. Phiri, C. (2025*). Economic blackouts: Unravelling the causes and impacts of electricity rationing in Zambia*. SSRN Working Paper.
21. Pungwa, L., and Moonasamy, A. R. (2024). *Obstacles encountered by university students during teaching and learning amid load shedding in South Africa*. African Journal of Development Studies, 14(3).
22. Selemani, C., and Sikombe, S. (2026). *Exploring operational coping strategies of private hospitals amid load shedding in Zambia*. African Journal of Commercial Studies, 7(3), 375–381.
23. Tembe, Z. N., and Hlengwa, D. C. (2022). *Strategies used by B&Bs and guesthouses to mitigate the impacts of load shedding in South Africa*. Strategies, 11(3), 1020–1037.
24. Thembane, N. (2024). *Navigating the power outages: Impact and coping strategies of students in a South African university during load shedding*. Journal of Student Affairs in Africa, 12(2), 131–142.
25. Togo, M., Gandidzanwa, C. P., & Mogashoa, M. (2021). *Coping with water, energy, and food challenges: A case study of low-income households in Soweto, Johannesburg, South Africa.*

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