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Exploring the Impact of COVID-19 on Students' Online Learning Experiences in Selected Public Learning Institutions in Lusaka, Zambia

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Abstract

The Coronavirus pandemic, officially known as COVID-19 significantly interrupted education systems globally, compelling a rapid shift to online learning. This study explores the impact of COVID-19 on students' online learning experiences in selected public learning institutions in Lusaka, Zambia. Conducted between 2020 and 2021, the study employed a descriptive research design and collected data from 200 respondents using questionnaires. The findings of the study reveal widespread adoption of online learning platforms, with Google Classroom and Moodle being the most utilized, with respondent representation of 47% and 26.5%, respectively. Despite the effectiveness of these online platforms, students faced numerous challenges, which included weak internet connectivity, erratic power supply, and inadequate infrastructure. The demographic analysis indicated that the majority of respondents were aged 16-25, reflecting a younger student population. Gender distribution showed a male predominance, aligning with national enrollment statistics. Most students engaged frequently with online learning platforms, but issues such as internet accessibility and personal circumstances affected their utilisation. The study concludes that while online learning provided a crucial alternative during the COVID-19 pandemic, significant improvements are needed in internet accessibility, affordability, and infrastructure to enhance the online learning experience. Recommendations include bolstering digital infrastructure and providing support to students and institutions to ensure effective and equitable access to online education.

Keywords: COVID-19 Pandemic, Online Learning, Internet Access, Google Classroom, Lusaka, Zambia

1. Introduction

The Coronavirus pandemic, officially known as COVID-19, was first identified in Wuhan, China in December 2019. By January 2020, the virus had already spread widely across the globe, leading to its classification by the World Health Organization (WHO) as a public health emergency of international concern (WHO, 2020). The rapid transmission of the virus and its severe health implications prompted WHO to declare it as a pandemic in March 2020 (WHO, 2020). Further, governments worldwide were compelled to implement strict measures in order to contain the spread of the disease. Such measures included lockdowns, social distancing protocols, and remote working arrangements. While necessary to protect public health, these measures had devastating effects on various sectors of global economy, including education. The pandemic hit the education sector so hard that institutions of learning were forced to close their doors in order to prevent the spread of the virus among learners, academic staff, and other workforce. This unexpected closure of learning institutions disrupted the learning process for numerous students around the world, leading to fears about the long-term impact of the virus on their education and future prospects. In response to these challenges, many learning institutions quickly transitioned to online learning platforms to ensure the continuity of learning during the pandemic (Simamora, 2020) [18].

The transitioning to online learning was not without its challenges. Many learning institutions, students, and teachers themselves were not adequately prepared for the sudden transition to online learning, leading to issues with access to technology, internet connectivity, and digital literacy. In addition, the remote nature of online learning presented challenges in maintaining engagement with and motivation to the learners, as well as in assessing progress and performance of the learners (Adedoyin & Soykan, 2020) [2]. Notwithstanding these challenges, the COVID-19 pandemic also highlighted the benefits of

online learning, such as increased flexibility and accessibility, which may have long-term implications for the future of the education system. Several studies have already highlighted the impact of COVID-19 on education globally. For instance, Abbasi *et al*. (2020) [1] conducted a study on the perceptions of learners with regards to e-learning during COVID-19 at a private medical college in Pakistan, emphasizing the widespread adoption of online learning platforms as a response to the pandemic. Similarly, Ali (2020) [3] emphasized the necessity of online and remote learning in higher education learning institutions amid the COVID-19 pandemic, highlighting the role of digitalization in ensuring the continuity of education. These studies underscore the transformative impact of the pandemic on education and the need for innovative solutions to ensure the delivery of quality education in challenging times.

In Zambia, like many other countries, the education sector faced significant disruptions due to the COVID-19 pandemic. Public learning institutions in Lusaka, such as the University of Zambia (UNZA), the National Institute of Public Administration (NIPA), Evelyn Hone College, and the Zambia Centre for Accountancy Studies (ZCAS), were forced to adapt to and enhance new modes of learning to ensure the continuity of education for their students. This study sought to explore the impact of COVID-19 on students' online learning experiences in these institutions, with a focus on understanding the challenges faced and identifying potential strategies for improvement.

The transition to online learning was faced with so many challenges. Various studies identified challenges such as internet connectivity issues, technological barriers, and the lack of face-to-face interaction as significant impediments to effective online learning experiences. For instance, Bączek *et al*. (2020) [6] surveyed Polish medical students, revealing these challenges as major obstacles. Similarly, Awojide (2020) [5] discussed the directive by the Nigerian Minister of Education for tertiary institutions to resume online learning, highlighting concerns about the readiness of students and institutions.

Despite these challenges, online learning has demonstrated its potential to provide flexible and accessible education opportunities. Bali and Liu (2018) [7] explored students' perceptions toward online learning and face-to-face learning courses, highlighting the advantages of online learning in terms of flexibility, convenience, and self-paced learning. Additionally, Chung *et al*. (2020) [10] examined online learning readiness among university students in Malaysia amidst COVID-19, emphasizing the importance of digital literacy and technological preparedness in facilitating successful online learning experiences.

1.1 Insights on online learning

Over the past few decades, the advent of the internet and digital technologies has progressively influenced the educational sector (Johnson *et al*., 2016) [15]. Before the outbreak of the COVID-19 pandemic, online learning was already gaining ground as a complementary mode of education in various learning institutions worldwide (Allen & Seaman, 2017) [4]. Institutions of higher learning increasingly adopted Learning Management Systems (LMS) and other digital tools to enhance traditional face-to-face mode of learning (Educause, 2018) [14]. However, the global pandemic served as a catalyst, accelerating the adoption of online learning on an unprecedented scale (Dhawan, 2020) [12]. The necessity of remote learning highlighted the digital divide, exposing inequalities in access to technology and internet connectivity among students (Van Deursen & Van Dijk, 2019) [19].

In addition, several researchers had explored the effectiveness of online learning in various educational contexts prior to the pandemic. Studies by Means *et al*. (2009) [16] found that online learning could be as effective as traditional face-to-face mode of learning, provided that the digital content was well-designed and that students had the necessary support systems in place. Other researchers, such as Nguyen (2015) [17], emphasized the importance of student engagement and interactivity in online learning settings to ensure learning outcomes comparable to those of traditional classroom environments. During the pandemic, the urgency of transitioning to online learning prompted numerous studies to assess the immediate impacts of this mode of learning to both the students and teachers. For instance, Basilaia and Kvavadze (2020) [8] examined the transition to online education in Georgia, noting the rapid implementation of e-learning platforms and the associated challenges such as digital literacy and infrastructure. Similarly, Crawford *et al*. (2020) [11] conducted a comparative analysis of online learning adaptation strategies in higher education across several countries, identifying best practices and common obstacles.

The foundation laid by these earlier researches saves as the basis for this study, which specifically focuses on the context of public learning institutions in Lusaka, Zambia. While global studies provide valuable insights, the unique socio-economic and infrastructural challenges faced by Zambian institutions necessitate a localized examination. This research aims to fill the gap by exploring the specific impacts of COVID-19 on students' online learning experiences in selected public institutions in Lusaka, thereby contributing to the broader discourse on educational resilience and adaptation in the face of global crises.

1.2 Aims and Objectives

1.2.1 Aim

The primary aim of this study was to explore the impact of COVID-19 on students' online learning experiences in selected public learning institutions in Lusaka, Zambia. To achieve this aim, the study had the following objectives:

1.2.2 Objectives

1. To establish the preferred online learning platforms used by students in selected learning institutions
2. To determine the frequency of students' use of online learning platforms in these institutions.
3. To assess the effectiveness of online learning platforms and tools used by the institutions
4. To assess student satisfaction with online learning during the COVID-19 Pandemic
5. To determine the challenges faced and propose potential strategies for improving online learning experiences.

By achieving these objectives, this study aimed to provide valuable insights that could inform policy decisions and educational practices, ensuring that students in Lusaka, Zambia, and similar contexts continue to receive quality education despite the challenges posed by the COVID-19 pandemic.

2. Materials and methods

The aim of this study was to explore the impact of COVID-19 on students' online learning experiences in selected public learning institutions in Lusaka, Zambia. The study targeted four public learning institutions, namely: The National Institute of Public Administration (NIPA), the University of Zambia (UNZA), Evelyn Hone College, and the Zambia Centre for Accountancy Studies (ZCAS). All these institutions offer three streams of learning, which include full-time (FT), part-time (PT), and distance learning (DL). Therefore, the target group for this study included all students enrolled in these institutions across all the three streams.

For the purpose of primary data collection, a total of 284 respondents were selected for the study using a simple random sampling technique. This involved selecting 71 participants from each learning institution, from various academic disciplines and levels of study to ensure a representative sample. The study aimed for a response rate of 75%, with 200 respondents ultimately participating in the study.

Data was collected using a self-administered questionnaire, which was distributed to the selected respondents. As demonstrated by Bryman and Bell (2003) [9], a self-administered questionnaire is the only way to elicit self-report on people's opinion, attitudes, beliefs and values. Therefore, the questionnaire was designed to provoke information on students' experiences with online learning during the COVID-19 pandemic, including their access to technology, internet connectivity, challenges faced, and overall satisfaction with online learning system. The questionnaire was distributed electronically due to the restrictions on physical gatherings, which were imposed during the pandemic.

The collected data was analyzed using Microsoft Excel. Descriptive statistics were used to analyze the data, including frequencies and percentages, to identify patterns and trends in students' online learning experiences. The findings were then interpreted in order to draw conclusions about the impact of COVID-19 on students' online learning experiences in the selected public learning institutions in Lusaka, Zambia.

3. Results and Discussions

This study investigated the impact of COVID-19 pandemic on students' online learning experiences in selected public learning institutions in Lusaka, Zambia. The results provide valuable insights into various aspects of students' experiences with online learning platforms, and challenges they faced.

3.1 Demographic profile of respondents

The demographic profile of the respondents in this study revealed that the majority were between the ages of 16 to 25, representing undergraduate students (Table 1).

Table 1: Demography of respondents

Age Range	Frequency	Percentage (%)
16- 20 years	82	41
21-25 years	88	44
26- 30 years	15	7.5
31- 35 years	11	5.5
36- 40 years	4	2
Total	**200**	**100**

This age group of between 16 to 25 is typical for university students, and aligns with the findings of similar studies conducted in different regions, such as the study by Dube *et al*. (2020) [13] in South Africa, which also reported that a predominant age range of 18 to 24 years among university students engaged in online learning during the COVID-19 pandemic. The age distribution highlights that younger students, who are generally more exposed and adaptable to new technologies, were the primary users of online learning platforms during the pandemic.

3.2 Gender distribution of the respondents

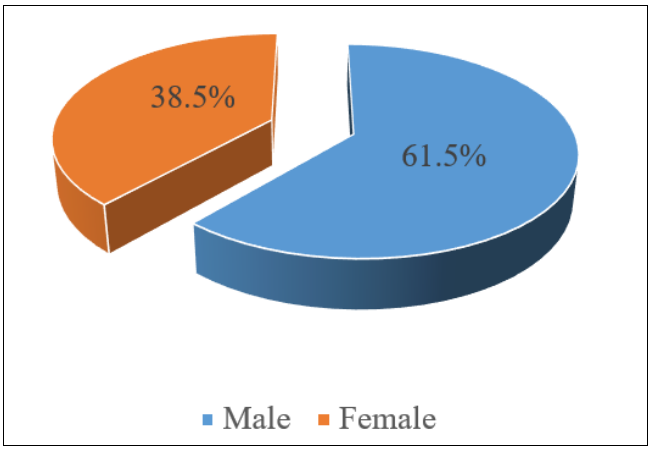

Fig 1: Gender of respondents

In terms of gender distribution, the sampled respondents exhibited a male-dominated distribution, with about 62% males and approximately 39% females (Fig 1). This distribution is reflective of the overall gender composition in most higher learning institutions in Zambia, as supported by the 2019 Zambia Education Statistical Bulletin, which indicated a higher enrollment of male students in tertiary education compared to female students. Similar gender disparities in online learning participation were observed in studies conducted in other African countries, such as Nigeria (Adedoyin & Soykan, 2020) [2], where male students were reported to have higher engagement levels in online learning compared to their female counterparts.

3.3 Utilization of online learning platforms during COVID – 19

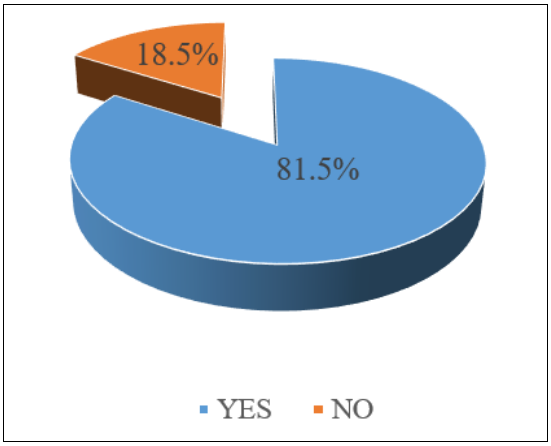

Fig 2: Utilization of online learning platforms

In determining whether students utilised or did not utilise online learning platforms (Fig 2), the study established that a significant majority of respondents (81%) reported using online learning platforms during the COVID – 19 pandemic. This widespread adoption of online learning aligns with the global trend observed during the COVID-19 pandemic, where educational institutions rapidly transitioned to online platforms to ensure continuity of learning. According to a study by Dhawan (2020) [12], online learning became a critical tool for education delivery during the pandemic, with institutions worldwide adopting various online platforms to facilitate remote learning. This underscores the critical role that online learning played in ensuring the continuity of learning during the pandemic.

3.4 Preferred online learning platforms used by students in selected learning institutions during COVID – 19

During the COVID-19 pandemic, learning institutions worldwide quickly transitioned to various online learning platforms in order to maintain educational continuity. In the Zambian context, several platforms were used by students, including Google Classroom, emails, WhatsApp, Facebook, and Moodle. As shown in Table 2 below, Google Classroom emerged as the most widely utilized online learning platform, with 47% of respondents reporting its utilisation. This was followed by Moodle, which was used by 26.5% of the respondents. Other platforms such as emails (14.5%), WhatsApp (8.5%), and Facebook (3.5%) were less frequently utilised.

Table 2: Online learning platforms used by students

Platforms	Frequency	Percentage
Google classroom	94	47
Emails	29	14.5
WhatsApp	17	8.5
Facebook	7	3.5
Moodle	53	26.5
Total	**200**	**100**

The preference for Google Classroom established in this study aligns with findings from other studies, such as Abbasi *et al*. (2020) [1], who reported similar trends in Pakistan. The popularity of this platform can be attributed to its user-friendly interface and ease integration with other Google services, which enhance its functionality and simple to use. Google Classroom allows for efficient distribution and management of assignments, quick communication between students and teachers, and integration with various third-party applications, making it a comprehensive tool for online learning activities (Abbasi *et al*., 2020; Ali, 2020) [1, 3]. On the other hand, Moodle, which is the second most used platform, is known for its open-source nature and flexibility, which makes it a popular choice among higher learning institutions. Moodle provides a customizable environment that can be tailored to the specific needs of an institution, offering features such as forums, quizzes, and detailed tracking of student progress. Its adaptability and wide range of functionalities make it one of the best platforms for comprehensive online education (Allen & Seaman, 2017) [4].

The use of emails, while less interactive than Google Classroom and Moodle, was also significant at 14.5%. Emails provide a straightforward and accessible means of communication and content distribution, which can be particularly useful in situations where students and teachers might face challenges in accessing more complex platforms (Basilaia & Kvavadze, 2020) [8]. Online platforms like WhatsApp (8.5%) and Facebook (3.5%) had lower usage rates, indicating that mainstream educational platforms were preferred for formal learning activities. WhatsApp, while predominantly a messaging application, has been used by some teachers for quick communication and sharing of resources due to its widespread use and accessibility. Facebook, typically a social networking site, has also been leveraged for educational purposes, though its usage is significantly lower compared to mainstream educational platforms such as Google Classroom and Moodle (Dube, 2020; Awojide, 2020) [13, 5].

The significant reliance on mainstream platforms suggests a preference for structured and adaptable environments capable of supporting various aspects of online learning. These platforms offer features that are specifically designed for educational purposes, including assignment management, grading, and collaborative tools, which are vital for maintaining the quality and integrity of the learning experience (Nguyen, 2015; Educause, 2018) [17, 14].

3.5 The frequency of students' use of online learning platforms and challenges faced during COVID – 19

The COVID-19 pandemic led to a significant shift in the way education was delivered, with online learning platforms becoming essential tools for maintaining educational continuity. In Zambia, the frequency of students' use of these platforms varied, as shown in Table 3 below.

Table 3: Frequency of students` use of online learning platforms

How Frequent	Frequency	Percent
Very frequently	58	29
Frequently	79	39.5
Not very frequently	48	24
Not frequently	15	7.5
Total	**200**	**100**

The data in Table 3 above indicates that a substantial percentage of students engaged with online learning platforms frequently (39.5%) or very frequently (29%). However, 24% of students reported less frequent use, and 7.5% indicated they did not use these platforms frequently. Other factors such as course workload and the nature of assignments also influence how frequently students use online platforms. Courses that are more intensive and require regular submissions and interactions may see higher engagement levels. On the other hand, courses that do not heavily rely on online activities may see reduced platform usage (Abbasi *et al*., 2020) [1]. Personal circumstances, such as home environment and individual responsibilities, further impact the ability of students to participate in online learning. For example, students managing family responsibilities or employment may find it challenging to engage as frequently as their colleagues (Adedoyin & Soykan, 2020) [2]. In addition, the lack of a conducive learning environment at home can prevent students from frequent participation (Bączek *et al*., 2020) [6], leading to all these variations. The variation in frequency of platform use also highlights the importance of addressing digital divide issues. Van Deursen and Van Dijk (2019) [19] discuss how inequalities in digital access translate into disparities in online learning engagement. Ensuring that all students have

equal access to necessary technological resources and internet connectivity is essential for consistent and effective participation in online education.

3.6 The effectiveness of online learning platforms and tools used during COVID 19

The results from table 4 below indicate that the majority of students found online learning platforms and tools to be either "effective" (45%) or "very effective" (26%) during the COVID-19 pandemic. This positive perception underscores the significant role that online learning played in maintaining educational continuity amidst the global crisis. However, the fact that 22.5% of students deemed online learning "not effective" highlights the areas needing improvement and the challenges faced by some students.

Table 4: Effectiveness of online learning

How effective	Frequency	Percentage (%)
Very effective	52	26
Effective	90	45
Not effective	45	22.5
Not applicable	13	6.5
Total	**200**	**100**

The effectiveness of online learning, as perceived by students in this study, is supported by numerous studies. Ali (2020) [3] suggests that online learning can be a viable alternative to traditional classroom settings, especially when supported by adequate resources and infrastructure. This sentiment is echoed by Nguyen (2015) [17], who argues that the effectiveness of online learning extends beyond the "no significant difference" phenomenon, suggesting potential advantages when appropriately implemented. The positive response from a majority of students can be attributed to several factors. First, the flexibility and accessibility of online learning platforms enabled students to continue their education despite lockdowns and social distancing measures (Dhawan, 2020) [12]. The ability to access course materials at any time and from any location was crucial in maintaining engagement and learning continuity (Crawford *et al*., 2020) [11]. Moreover, the integration of diverse online tools such as video lectures, discussion forums, and interactive assignments likely contributed to the perceived effectiveness. These tools facilitated varied learning styles and provided multiple avenues for students to engage with the content (Bali & Liu, 2018) [7]. The enhancement of digital pedagogy, as discussed by Crawford *et al*. (2020) [11], played a critical role in improving the online learning experience across different educational institutions.

However, the 22.5% of students who found online learning "not effective" point to underlying issues that need addressing. Adedoyin and Soykan (2020) [2] identify challenges such as inadequate internet connectivity, lack of access to necessary devices, and limited digital literacy as significant barriers to effective online learning. These issues disproportionately affect students in rural or economically disadvantaged areas (Dube, 2020) [13]. Furthermore, the unexpected transition to online learning during the pandemic meant that both students and teachers had to adapt quickly to new technologies and methodologies, often without sufficient training or preparation (Simamora, 2020) [18]. This rapid shift may have contributed to the difficulties experienced by some students, emphasizing the need for ongoing support and training for effective online education delivery. The need for strong support systems is crucial. Basilaia and Kvavadze (2020) [8] highlight the importance of institutional support in facilitating a smooth transition to online learning. This includes providing reliable technical support, ensuring access to digital resources, and offering training for both students and educators to effectively utilize online platforms.

3.7 Student satisfaction with online learning during the COVID-19 Pandemic

This study revealed that a majority of students (58%) were satisfied with their online learning experiences during the COVID-19 pandemic (Fig 3). This level of satisfaction highlights the adaptability and resilience of students in embracing online education despite the challenges posed by the global health crisis. The satisfaction levels observed in this study are consistent with findings by Aristovnik *et al*. (2020), which also reported varied levels of student satisfaction with online learning during the pandemic, influenced by factors such as the quality of online teaching, interaction with teachers, and availability of resources.

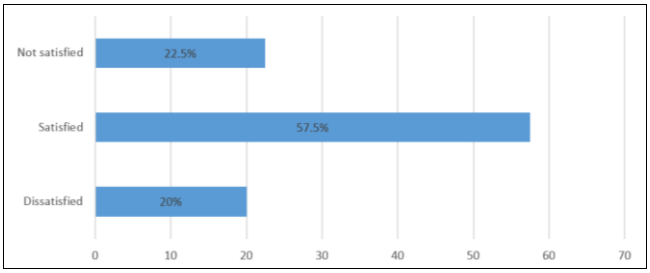

Fig 3: Student satisfaction with online learning

The positive reception of online learning by students can be attributed to several factors. First, the flexibility offered by online platforms allowed students to manage their learning schedules more effectively, accommodating other responsibilities and commitments (Dhawan, 2020) [12]. This flexibility was fundamental during the pandemic, as students navigated various challenges, including health concerns and disruptions in their daily lives (Adedoyin & Soykan, 2020) [2]. In addition, the availability of different online tools and resources likely contributed to student satisfaction. Features such as video lectures, interactive assignments, and discussion forums facilitated engaging and interactive learning experiences, enhancing student understanding and retention of course material (Bali & Liu, 2018) [7]. The integration of these tools into online education platforms has been shown to positively impact student engagement and satisfaction (Bryman & Bell, 2003) [9].

Moreover, the findings of this study suggest that institutions that provided adequate support and guidance to students in their online learning journey were more likely to receive positive feedback. Institutions that offered comprehensive training for students and instructors on the use of online platforms, as well as ongoing technical support, were better equipped to meet the needs of their learners (Basilaia & Kvavadze, 2020) [8]. Despite the overall positive response, it is crucial to address the concerns of the 23% of students who were not satisfied and the 20% who were dissatisfied with online learning. Understanding the factors contributing to their dissatisfaction, such as connectivity issues, lack of engagement, or ineffective teaching methods, can help

institutions adapt their online education strategies to better meet the needs of all students (Simamora, 2020) [18].

3.8 Challenges faced in online learning by students during COVID – 19

As shown in table 5 below, the findings of this study reveal several challenges faced by students in using online learning platforms during the COVID-19 pandemic, with poor internet connectivity being the most significant obstacle (79.5%). This challenge is consistent with findings from other studies, such as those by Adedoyin & Soykan (2020) [2], Simamora (2020) [18] and (Crawford *et al*., 2020) [11], which also identified internet connectivity issues as a major barrier to effective online learning. Bączek *et al*. (2020) [6] conducted a survey study of Polish medical students, revealing students' perceptions of online learning during the pandemic, and similarly identified challenges such as internet connectivity issues, technological barriers, and the lack of face-to-face interaction as significant impediments to effective online learning experiences.

Table 5: Challenges in using online learning platforms by students

Challenges	Frequency	Percent
Weak internet	159	79.5
Erratic power supply	22	11
Lack of internet facilities	14	7
Poor infrastructure	4	2
Lack of Computer	1	0.5
Total	**200**	**100**

Erratic power supply (11%) and lack of access to necessary technology (7%) were also significant challenges faced by students. These infrastructural challenges are common in many developing countries like Zambia, highlighting the need for investment in improving digital infrastructure and access to technology to support online education (Basilaia & Kvavadze, 2020; Dube, 2020) [8, 13]. The findings of this study, therefore, align very well with global observations where students' engagement with online learning platforms has been inconsistent due to similar challenges. For instance, a study by Basilaia and Kvavadze (2020) [8] in Georgia observed that while some students adapted quickly to online learning, others faced significant challenges due to poor internet connectivity and lack of digital devices. Similarly, research in Pakistan found that students' access to e-learning was heavily influenced by their socioeconomic status and the availability of technological resources (Ali, 2020) [3].

The challenges identified in the study underscore the digital divide that exists among students, with disparities in access to technology and reliable internet connectivity affecting the quality of online learning experiences. This divide was further worsened by the COVID-19 pandemic, which forced educational institutions to rely more heavily on online platforms for teaching and learning (Van Deursen & Van Dijk, 2019) [19]. Addressing these challenges requires a multi-faceted approach, including investment in digital infrastructure, provision of affordable and reliable internet access, and training for both students and instructors on effective online learning practices (Dhawan, 2020; Dube, 2020) [12, 13]. Additionally, institutions need to ensure that online learning platforms are designed to be accessible and user-friendly, particularly for students with limited technological proficiency (Nguyen, 2015) [17].

4. Conclusion

The study on the impact of COVID-19 on students' online learning experiences in selected public learning institutions in Lusaka, Zambia, reveals significant insights into the challenges and successes of the rapid transition to online education. Despite the widespread adoption of online learning platforms like Google Classroom and Moodle, students faced numerous obstacles, including weak internet connectivity (79.5%), erratic power supply (11%), lack of internet facilities (7%), poor infrastructure (2%), and lack of computers (0.5%). These challenges affected the frequency and effectiveness of online learning for many students. The demographic analysis showed a younger student population predominantly aged 16-25, with a higher proportion of male students, reflecting broader national trends in enrollment. The study found that while a majority of students engaged frequently with online learning platforms and rated the experience as effective or very effective, a notable portion encountered significant difficulties that hampered their learning experiences. To enhance the online learning environment, the study recommends substantial improvements in internet accessibility, affordability, and digital infrastructure. Providing adequate support to both students and institutions is crucial to ensure effective and equitable access to online education. These findings underscore the need for ongoing efforts to address the digital divide and to support the continuity of quality education in the face of global crises.

5. Recommendations

1. **Improving internet connectivity and infrastructure:** Considering that 79.5% of students cited weak internet connectivity as a major challenge, it is essential to improve internet infrastructure. This can be achieved through partnerships between the government, other educational institutions, and private sector internet service providers to expand broadband coverage and increase internet speeds.
2. **Investing in stable and reliable power sources:** In order to address the issue of erratic power supply (11%), investments in stable and reliable power sources are essential. Backup power solutions, such as generators or solar power systems, can be provided to institutions and students in areas prone to power outages.
3. **Providing adequate training to both students and teachers on the use of online platforms:** While Google Classroom and Moodle were the most utilized platforms, with 47% and 26.5% of students respectively, institutions should ensure these platforms are well-supported and users are adequately trained. Having regular workshops and help desks can assist students and teachers in maximizing the use of these platforms. Institutions should also have strong technical support systems that can help address issues promptly, ensuring minimal disruption to the learning process. This includes having IT support teams available to resolve connectivity or platform-related issues.
4. **Encourage female participation:** Since the study revealed a male-dominated respondent pool (62% male vs. 39% female), initiatives to encourage and support female students in online learning should be implemented. This could include mentorship programs, scholarships, and targeted outreach efforts.

5. **Making internet services affordable:** Learning institutions should negotiating with internet service providers to offer affordable internet packages specifically for students that can help mitigate the digital divide. Subsidized data plans or free access to educational websites can be considered.
6. **Establishing community centers equipped with internet and computers** can provide students without home access a place to engage in online learning. These centers should be located in accessible areas for students from diverse socioeconomic backgrounds.

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