



ISSN 2278 – 0211 (Online)

Perceptions of Lecturers and Students on the Implementation of Virtual Learning in Universities within the Northern Zone, Tanzania

Lomunyaki Pipiyo Mollel

Ph.D. Student, Doctor of Philosophy in Educational Planning and Administration
(PhD-EPA), Mwenge Catholic University (MWECAU), Tanzania

Evans Ogoti

Associate professor, Department of Educational Management and Planning,
Mwenge Catholic University (MWECAU), Tanzania

Timothy Mandila

Senior Lecturer, Department of Educational Psychology and Curriculum Studies (DEPC), Mwenge
Catholic University (MWECAU), Tanzania

Abstract:

This study aimed to examine the perceptions of lecturers and students towards implementing virtual learning (VL) in universities within the Northern Zone of Tanzania. The study was guided by the technology acceptance model and adopted a convergent design under a mixed-method approach that enabled the collection of quantitative and qualitative data. The study targeted 6 DVCs responsible for academics, 6 system administrators, 740 lecturers and 6200 university students. The study sample consisted of 4 DVCs responsible for academics, 4 system administrators, 74 lecturers and 620 students. The DVCs and system administrators were selected using criterion purposive and expertise sampling techniques, respectively, while stratified random sampling was used to select lecturers and students. Data were collected using questionnaires, interview guides and observation guides. Research experts validated these instruments before using them for data collection. The instruments were further piloted in two universities, and the piloting results were used to estimate their reliability. The calculated reliability coefficients were 0.906 for the students' questionnaire and 0.883 for the lecturers' questionnaire. Descriptive and inferential statistics were used to analyze the quantitative data with the aid of SPSS version 22, while qualitative data were analyzed thematically with the help of ATLAS.ti software. The study found that both students and lecturers had positive perceptions towards implementing VL, and there was no significant difference in the perception mean scores between these two groups ($p > 0.05$). The study concluded that positive perceptions among stakeholders were essential for the effective implementation of VL and, therefore, recommended necessary strategies aiming at enhancing positive perceptions among lecturers and students.

Keywords: Perceptions, lecturers, students, virtual, learning, universities

1. Introduction

The Perception of Lecturers and Students on the Implementation of Virtual Learning in Universities within the Northern Zone of Tanzania has become a critical topic of discussion in higher education, especially amidst the increasing occurrence of virtual learning in higher learning institutions globally. This notable shift in educational paradigms, driven by technological advancements (Cheerapakorn & Chatwattana, 2023), is observable across continents, including Africa, Europe, Asia, and America, reflecting a broader trend towards digitalization in education. As educational institutions strive to meet the evolving needs of learners, Virtual Learning not only facilitates communication between students and educators but also fosters collaborative learning environments (Glusker et al., 2022).

The global outbreak of the COVID-19 pandemic further made the adoption of VL the only in the wake of lockdowns. Leading to the closure of educational institutions worldwide (Mbugi et al., 2022). In response to this disruption, universities swiftly transitioned from traditional in-person instruction to virtual learning platforms to ensure the continuity of education (Masonbrink & Hurley, 2020). This sudden shift prompted universities to embrace digital learning technologies, establishing virtual classrooms and comprehensive learning management systems (Rosak-Szyrocka et al., 2022). In Tanzania, as in many African countries, adopting VL has become imperative to address challenges such as accessibility, affordability, and flexibility in higher education (Badaru & Adu, 2022). Despite efforts to integrate VL platforms, issues surrounding the perceptions of educators and students remain significant barriers (Mbugi et al., 2022). Perceptions play a crucial role in implementing virtual learning initiatives as they influence lecturers' and students'

engagement and satisfaction with the learning process (Ogbodoakum, 2022). However, implementing virtual learning is marked by diverse perceptions and beliefs among stakeholders. These mixed perceptions present challenges to its complete integration into educational practices. For example, while VL offers unprecedented flexibility and accessibility, not all educators and students embrace it wholeheartedly (Wetherby & Carpenter, 2022). Similarly, in various contexts, experienced professors have shown a reluctance to fully embrace virtual classrooms, citing concerns about unfamiliarity and discomfort compared to traditional teaching methods (Ekunola, 2022). The reluctance to fully adopt VL may negatively affect implementation in the teaching and learning process.

In China, where e-learning is widespread, Liu (2023) identified disparities in perceptions between lecturers and students, and the complexity of aligning stakeholders' views towards VL was highlighted. Similarly, Aina and Ogegbo (2021) revealed that only a few lecturers exhibit positive attitudes towards transitioning from conventional teaching to VL environments within South Africa. Salema (2023) found a positive perception among teachers and learners towards online teaching and learning during the COVID-19 pandemic in Tanzania. However, according to Mushi and Lashayo (2022), there is limited literature available on perceptions post-pandemic, thereby creating a gap for further research to assess the perceptions of lecturers and students regarding the implementation of VL, particularly focusing on the Northern Zone as the study area.

2. Statement of the Problem

The mixed perceptions, the reluctance of some professors (Mwakyusa & Ng'webeya, 2022) and disparities between lecturers and students (Almas et al., 2021) regarding the adoption of virtual classrooms raise significant concerns about the smooth integration of VL into educational practices. These challenges call attention to the complexity of aligning stakeholders' views towards VL and highlight potential barriers to its effective implementation. Despite the increasing prevalence of VL globally, particularly accelerated by the COVID-19 pandemic (Salema, 2023), there is a notable gap in the literature regarding post-pandemic perceptions towards VL, specifically within the Tanzanian context. This knowledge gap constrains an understanding of the factors that influence the implementation of VL tools among lecturers and students in Tanzanian universities. Therefore, to address this gap, the current study sought to assess the perceptions of both lecturers and students towards implementing VL in Tanzanian universities, with a specific focus on the Northern Zone.

3. Research Question and Hypothesis

This study was aimed at answering one research question and test one hypothesis as stated here:

- What are the perceptions of students and lecturers towards implementing VL in the Northern Zone Universities of Tanzania?
- H_a : There is a significant difference in university students' and lecturers' perception means scores regarding implementing VL.

4. Theoretical Framework

This study was guided by the Technology Acceptance Model (TAM), introduced by Fred Davis in 1989. As one of the most widely utilized frameworks to predict technology acceptance and usage, TAM suggests that individuals' intention to embrace and utilize technology is influenced by two primary factors: perceived ease of use and perceived usefulness (Su & Li, 2021). Perceived ease of use is "the extent to which a person believes that using a specific technology will be straightforward and require minimal effort." In contrast, perceived usefulness denotes "the degree to which an individual believes that employing a particular technology will enhance their job performance" (Alismaiel, Cifuentes-Faura & Al-Rahmi, 2022). According to the model, technology usage is driven by behavioural intention, shaped by an individual's attitude towards the technology and their perception of its utility (Kalayou, Endehabtu & Tilahun, 2020). Attitudes and beliefs are crucial in determining whether a person will adopt a new technology. Therefore, in the context of this study, the perceived ease of use by lecturers and students significantly influences the adoption and integration of virtual learning platforms. Likewise, the belief that virtual learning tools will improve student performance will strongly impact the uptake and implementation of these systems.

TAM can be further extended to assess external factors that affect technology adoption, such as the readiness of universities for virtual learning implementation. Its strength lies in its predictive power, effectively applied across various sectors, including education. The model's simplicity and two core variables make it easy to understand and apply. However, without modification, the theory has limitations. It may not fully explain how users adopt and utilize technology in all contexts, as it focuses primarily on attitudes, overlooking other significant factors like economic and cultural influences. Furthermore, TAM does not quantify behaviors and attitudes but relies on subjective opinions. In this study, TAM was applied to evaluate the perceptions of both students and lecturers regarding implementing virtual learning (VL) in universities in Tanzania's Northern Zone. The assessment focused on how students and lecturers perceive the usefulness of virtual learning systems compared to traditional face-to-face methods. The study revealed that the higher the perceived usefulness and ease of use of virtual learning systems, the more likely lecturers and students were to adopt and implement these platforms. The findings showed that both groups held positive perceptions regarding the use of VL, indicating that these attitudes strongly influence their readiness to integrate virtual learning tools into their educational environment.

5. Review of Empirical Studies

Several studies have examined lecturers' and students' perceptions of the implementation of VL in developed countries. For instance, Liu (2023) explored the perceptions of university lecturers and students regarding E-learning in China. Utilizing a phenomenological approach, the study revealed both matches and mismatches in perceptions between lecturers and students, suggesting significant differences in their views on the benefits and challenges of E-learning. Similarly, Jabali (2022) investigated the perceptions and actual use of E-learning tools among engineering students and lecturers in Saudi Arabia. Disparities were found between students and lecturers, indicating an overestimation of tool utilization. Mutalibetal (2022) systematically reviewed distance learning effectiveness among health sciences students during the pandemic. While acknowledging the benefits of flexibility, they highlighted challenges such as internet connectivity and limited interaction. However, the generalizability of these findings to Tanzania might be limited due to the developed countries' unique educational and cultural context.

Several studies across African nations have explored perceptions and challenges related to adopting virtual learning in higher education. For instance, in Morocco, Belkhou and Ghalmat (2023) discovered that despite encountering technical difficulties, professors maintained a positive outlook toward online education during the COVID-19 pandemic. Likewise, research conducted in Zimbabwe by Dangaiso et al., (2022) emphasized the critical role of perceived e-learning service quality in shaping student satisfaction and loyalty. Meanwhile, Asuke and Ouma (2023) uncovered disparities in satisfaction levels between students and lecturers regarding e-learning implementation in Kenya. Though these studies show the perceptions of students and educators towards VL, the reliance on a single data collection mode limits the findings' generalizability to another context.

In the Tanzanian context, Salema (2023) examined the perceptions of Tanzanian lecturers and students on online teaching and learning during the COVID-19 outbreak, revealing positive attitudes toward VL. However, whether these perceptions have changed in the post-pandemic period remains unclear. Meanwhile, Mahali et al. (2019) investigated the influence of attitudes on the utilization of learning management systems (LMS) in Tanzanian public universities, indicating a positive relationship between attitudes and LMS usage among students. Nevertheless, this study did not explore perceptions in private universities, leaving a gap in understanding VL across different institutional settings. Therefore, the current study aims to address this gap by examining the readiness of both lecturers and students across public and private universities in Tanzania post-COVID-19, providing a comprehensive understanding of VL perceptions.

6. Demonstration of Knowledge Gap

The reviewed empirical studies have shown that perceptions of virtual learning vary among stakeholders, with studies in developed countries revealing disparities between lecturers and students and challenges related to tool utilization and connectivity. While studies in African countries have explored similar themes, they often focus on specific contexts and utilize single modes of data collection, limiting generalizability. For instance, studies in Morocco by Belkhou & Ghalmat (2023), Zimbabwe by Dangaiso et al. (2022), and Kenya by Asuke & Ouma (2023) have highlighted positive attitudes towards virtual learning but are restricted to single university contexts. In the Tanzanian context, while Salema (2023) and Mahali, Changilwa, and Anyona (2019) have provided insights into perceptions among lecturers and students, respectively, they do not encompass the full spectrum of university settings, particularly in private institutions. Thus, there is a knowledge gap regarding the comprehensive understanding of VL perceptions across diverse Tanzanian universities.

7. Research Methodology

This research employed a blended methodology, integrating quantitative and qualitative data collection techniques. The convergent design under the mixed methods approach allowed for the simultaneous collection of both types of data. This enabled separate analysis followed by an integrated interpretation of findings. This research design enabled a comprehensive understanding of the topic by leveraging the advantages of both quantitative and qualitative approaches. The target population included 6 Deputy Vice Chancellors for Academics, 6 system administrators, 740 lecturers, and 6,200 university students from six established universities in Tanzania's northern zone. This diverse population represented key stakeholders in the university's academic affairs and VL implementation.

The study employed both probability and non-probability sampling techniques to select the study sample that consisted of 4 deputy vice-chancellors responsible for academics (15%), 4 system administrators (15%), 74 lecturers (10%) and 620 students (10%). This makes a total of 702 respondents. Stratified random sampling was utilized to select four universities out of six, considering ownership (public and private). The sample was deemed representative, aligning with Kim et al. (2022), who suggested that an appropriate sample should constitute 10% and 30% of the target population. Stratified random sampling was applied to select lecturers and university students, ensuring gender representation. Criterion purposive sampling was employed to choose Deputy Vice Chancellors responsible for academic affairs, while expert purposive sampling was utilized to select system administrators based on their ICT roles and expertise.

The study employed a combination of questionnaires, interview guides, and observation guides as data collection instruments. Questionnaires were utilized to gather quantitative data from both lecturers and students. These tools featured 5-point Likert scale items designed to evaluate the perceptions of lecturers and students concerning the implementation of virtual learning (VL). The interview guide collected data from the DVCs and system administrators. The instruments had probing questions that allowed the researcher to collect detailed data through verbal discussion with the key informants. The validity of data collection instruments was ensured through content and face validity checks, involving experts in the field to review and provide feedback on the instruments. Pilot testing was conducted in two universities involving 2 DVCs, 2 System administrators, 18 lecturers and 100 students.

The results of pilot testing were used to improve the instruments before being used for the data collection. Reliability was assessed using Cronbach's Alpha coefficient. The reliability of the students' questionnaire was 0.906, while that of the lecturers' questionnaire was 0.883. These values exceeded the threshold of 0.7, indicating acceptable reliability, as Okendo et al. (2020) suggested. Data collection commenced following the issuance of an introduction letter from the Directorate of Postgraduate Research Innovation and Consultancy at Mwenge Catholic University. The researcher administered questionnaires and conducted face-to-face interviews.

Descriptive and inferential statistics were used to analyze quantitative data, where mean scores, frequencies, and percentages were generated. In contrast, an independent sample t-test was used to test the hypothesis with 95% confidence. Qualitative data from the interviews were analyzed through content analysis following the guidelines outlined by Hirose and Creswell (2023). This generated themes, sub-themes, codes, and citations identified and analyzed using ATLAS.ti software. Ethical considerations were paramount throughout the research process. During data collection, participants' anonymity, confidentiality, and voluntary informed consent were ensured. Finally, ethical standards regarding plagiarism, data confidentiality, and compliance with data protection laws were upheld during data analysis and reporting.

8. Data Presentation and Discussion of the Findings

The study sought to evaluate the perceptions of university lecturers and students regarding the implementation of virtual learning (VL) in higher education institutions. The objective was to determine how both groups viewed the concept of virtual learning. To achieve this, students and lecturers were given a perception scale in their questionnaires, which included ten statements. They were asked to indicate their level of agreement or disagreement using a five-point Likert scale (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree). The responses were analyzed to calculate percentages and mean scores. Data interpretation was based primarily on the mean scores: a score below 3.0 signified a negative perception, while a score above 3.0 indicated a positive perception. For clarity in reporting, the "Strongly Disagree" and "Disagree" categories were merged under "Disagree," while "Agree" and "Strongly Agree" were combined as "Agree." According to Feldman et al. (2008), mean scores ranging from 1.0 to 2.9 reflect negative perceptions, while scores from 3.0 to 5.0 suggest positive perceptions. The detailed findings for both lecturers and students are summarized in table 1.

	Respondents	Strongly Agree		Agree		Neutral		Disagree		Strongly Agree		Mean	Grand Mean
		f	%	f	%	f	%	f	%	f	%		
I believe VL equips me with valuable digital skills.	Students	204	37.0	199	36.1	113	20.5	25	4.5	10	1.8	4.02	3.70
	Lecturers	24	33.8	36	50.7	10	14.1	0	0.0	1	1.4	3.38	
I find VL activities to be interactive and dynamic.	Students	188	34.1	240	43.6	83	15.1	27	4.9	13	2.4	4.02	4.01
	Lecturers	21	29.6	36	50.7	10	14.1	2	2.8	2	2.8	4.01	
I find VL to be engaging.	Students	166	30.1	205	37.2	130	23.6	23	4.2	27	4.9	3.83	4.06
	Lecturers	15	21.1	42	59.2	10	14.1	2	2.8	2	2.8	4.3	
I prefer VL over traditional in-person classes.	Students	222	40.3	186	33.8	83	15.1	35	6.4	25	4.5	3.65	3.65
	Lecturers	15	21.1	29	40.8	18	25.4	5	7.0	4	5.6	3.65	
I would choose VL even if in-person classes were available.	Students	151	27.4	193	35.0	150	27.2	33	6.0	24	4.4	3.75	3.75
	Lecturers	19	26.8	26	36.6	19	26.8	4	5.6	3	4.2	3.76	
I would recommend VL to other students	Students	277	50.3	175	31.8	70	12.7	17	3.1	12	2.2	4.25	4.20
	Lecturers	21	29.6	39	54.9	7	9.9	3	4.2	1	1.4	4.10	
Multimedia elements in virtual classes make the learning experience enjoyable.	Students	215	39.0	172	31.2	77	14.0	75	13.6	11	2.0	3.92	3.51
	Lecturers	22	31.0	38	53.5	9	12.7	0	0.0	2	2.8	3.10	

	Respondents	Strongly Agree		Agree		Neutral		Disagree		Strongly Agree		Mean	Grand Mean
		f	%	f	%	f	%	f	%	f	%		
Overall, I have a positive attitude towards VL.	Students	217	39.4	235	42.6	71	12.9	17	3.1	11	2.0	4.14	4.22
	Lecturers	34	47.9	29	40.8	4	5.6	3	4.2	1	1.4	4.30	
VL tools are user-friendly and easy to navigate.	Students	160	29.0	203	36.8	139	25.2	36	6.5	13	2.4	3.84	3.32
	Lecturers	11	15.5	37	52.1	16	22.5	5	7.0	2	2.8	2.8	
VL provides me with the flexibility to manage my schedule.	Students	181	32.8	246	44.6	78	14.2	31	5.6	15	2.7	3.99	3.99
	Lecturers	23	32.4	31	43.7	13	18.3	2	2.8	2	2.8	4.00	
Grand mean	Students											3.98	3.97
	Lecturers											3.97	

Table 1: Students' (N = 551) and Lecturers' (N = 71) Perceptions on VL

Source: Field Data (2023)

Key: F= Frequency of Responses, %= Scores for Students' and Lecturers' Responses

Data in table 1 show that students and lecturers agreed that VL equips them with valuable digital skills, with 73.1% of students and 84.5% of lecturers agreeing. In contrast, only 6.3% of students and 1.4% of lecturers disagreed with this statement, while 20.5% of students and 14.1% of lecturers remained neutral. Mean scores further support this trend, with students averaging 4.02 and lecturers averaging 3.38. These findings indicate a strong positive perception of VL's role in enhancing digital skills among students and lecturers in the northern zone of Tanzania. This result aligns with the insights from Miço and Cungu (2022), who emphasized the importance of digital competence in educational experiences, and Mutalib et al. (2022), who highlighted the positive impact of online learning on academic performance. The acknowledgement of acquiring valuable digital skills through VL, supported by literature, underlines the perception that VL fosters technological proficiency among students and lecturers.

Data in table 1 also show that large percentages of students and lecturers find VL activities interactive and dynamic, with 77.7% of students and 80.3% of lecturers agreeing. On the other hand, only 7.3% of students and 5.6% of lecturers disagreed with this statement, while 15.1% of students and 14.1% of lecturers remained neutral. Mean scores further support this trend, with students averaging 4.02 and lecturers averaging 4.01. These results indicate a significantly positive perception regarding the interactive and dynamic aspects of virtual learning among both students and lecturers in Tanzania's northern zone. This implies that universities should invest much in virtual learning since this technology captures the educator's and learners' interest during teaching and learning. This sentiment aligns with the insights from Glusker et al. (2022), who reported that online learning has interactive materials that enhance students' engagement, and Salema (2023), who highlighted the positive perceptions of Tanzanian lecturers and students during the COVID-19 outbreak towards online teaching and learning, affirming the interactive nature of different modes of online learning.

The view of virtual learning (VL) activities as interactive and dynamic by many students and lecturers, supported by existing literature, suggests that both groups perceive VL as engaging and fostering active involvement. During the interview, one Coordinator for Distance Learning, while responding to the theme of Perceptions of VL among Students and Lecturers, remarked that:

Since both students and lecturers found VL activities interactive and dynamic, their perception has remained positive. From my knowledge and understanding, students generally find VL engaging. The interactive nature of VL activities also positively influences instructors. This engagement is crucial for maintaining student motivation and interest in the subject matter (DVC Academic Affairs, Personal Communication, 17th November).

In the views of the DVC Academic Affairs:

The perception of both students and lecturers has been positive since they found VL activities interactive and dynamic. From my knowledge and understanding, students generally find VL engaging. The interactive nature of VL activities also positively influences instructors. This engagement is crucial for maintaining student motivation and interest in the subject matter (DVC Academic Affairs, Personal Communication, 17th November 2023).

Respondents preferred virtual learning (VL) over traditional teaching methods, citing its numerous advantages, including the ability to engage from any location and at any time. This preference indicates a favorable perception of VL as both interactive and dynamic. Such findings corroborate the quantitative results regarding the engaging nature of virtual learning, highlighting a strong positive perception among students and lecturers in Tanzania's northern zone. This aligns with the research by Belkhou and Ghalmat (2023), which revealed that university professors in Morocco maintained positive attitudes toward e-learning despite facing technical and pedagogical obstacles. The significant perception of VL activities as interactive and dynamic among many students and lecturers, supported by existing literature, suggests that both groups view VL as engaging and conducive to active participation.

Both students and lecturers find VL engaging, with 67.3% of students and 80.3% of lecturers agreeing. In contrast, only 9.1% of students and 5.6% of lecturers disagree with this statement, while 23.6% of students and 14.1% remain

neutral. Mean scores further support this trend, with students averaging 3.83 and lecturers averaging 4.3. These results indicate a robust favorable perception of the interactive qualities of virtual learning (VL) among students and lecturers in the northern region of Tanzania. This aligns with the findings of Doe and Smith (2020), who also found that students and lecturers were generally positive about VL but were more enthusiastic than lecturers. Technical issues, like poor internet connectivity, were a significant barrier. Lecturers also reported concerns about their digital skills. It is worth pointing out that this study supported the current findings. With such high mean scores (3.83 and 4.3), these results imply that both students and lecturers view virtual learning (VL) as captivating, reflecting high engagement and enthusiasm in the educational experience. The recognition of VL as engaging by a notable percentage of students and lecturers implies active involvement and sustained interest in the learning process through this mode. This is further supported by the resource-based view theory, which emphasizes generating resources from internal and external sources to support University education, including VL implementation, as the way forward to solve the hurdles associated with physical classrooms.

According to the data in table 1, most students and lecturers prefer VL over traditional in-person classes, with 74.1% of students and 61.9% of lecturers agreeing. However, only 10.9% of students and 12.6% of lecturers disagreed with this statement, while 15.1% of students and 25.4% of lecturers remained neutral. Mean scores further support this trend, with students averaging 3.65 and lecturers averaging 3.65. The results indicate a significant preference for virtual learning (VL) over conventional classroom settings among students and lecturers in Tanzania's northern zone. This aligns with Mutalib's (2022) findings, which revealed that university students favour online learning over traditional approaches, reinforcing the current study's outcomes. The notable inclination toward VL suggests that many students and lecturers appreciate its interactive and adaptable qualities.

However, the presence of students and lecturers who disagreed with the statements shows some reluctance to embrace technology in teaching and learning. This aligns with what one of the system administrators reported during the interviews. The system administrator SA1 said, "You can get people who are conservative; they do not want to change. They think negatively, like, I am putting my information on the system, some people will steal; somebody will do this and that" (SA1; personal communication 28th November 2023). Another informant, SA2, said, "Regarding perception, we have two groups, the conservative and the liberal. Since the liberal group is the majority in our university, some conservatives are influenced to embrace VL, which motivates the institution to organize capacity building through frequent training" (SA2, personal communication 29th November 2023). This implies that a segment of academic staff harbours reservations and concerns about adopting technological advancements, potentially hindering the smooth integration of innovative learning methods.

The results align with Liu's (2023) research, which also noted variations in attitudes toward e-learning. The existence of hesitant lecturers can pose a substantial obstacle to successfully integrating virtual learning. Their reluctance may foster resistance to change, hinder adoption, and discourage others from embracing and investing in new educational technologies. This uncertainty can disrupt training programs, postpone the allocation of resources, and create an unfavourable atmosphere for effectively implementing virtual learning strategies in educational settings.

While collecting qualitative data during the interview, one of the DVC academics put forth the views that: *Based on my understanding as a member of top management at this university, most of our students and lecturers and the university management prefer VL, which is engaging and interactive as it solves the problems associated with traditional classes. Also, they consider it interactive and very engaging compared to face-to-face learning (DVC academic, personal communication, 29th November 2023).*

Additionally, another DVC Academics Affairs remarked that:

Honestly, I have no doubt that VL's preference over traditional in-person classes is growing, particularly due to its flexibility and convenience. Students can learn from anywhere and often appreciate the ability to manage their schedules more effectively, especially those balancing studies with other responsibilities. Similarly, through VL, students have managed to attend their lessons even when public transport to the university is unavailable due to public service vehicle strikes or heavy downpours (DVC Academics Affairs, Personal Communication, 19th December 2023).

The insights gathered from the interviews reveal a strong preference for virtual learning (VL) among students, faculty, and university administrators. This collective inclination indicates a notable change in attitudes towards online education within the institution. Additionally, VL is viewed as a viable solution to the challenges posed by traditional classroom settings. Consequently, it is essential to enhance the user-friendliness of the platforms, ensure access to engaging and interactive content, and provide dependable technical support. Although specific challenges are not outlined, common issues with traditional classes may include scheduling conflicts, limited physical space, commuting difficulties, and rigid learning schedules. Furthermore, VL is regarded as more interactive and engaging than in-person instruction, suggesting that VL's digital tools and platforms may incorporate features that foster student engagement, such as real-time polling, breakout rooms for collaborative discussions, multimedia resources, and interactive assessments.

Both students and lecturers express a positive attitude towards recommending VL to others, with 82.1% of students and 84.5% of lecturers agreeing. On the contrary, only 5.3% of students and 5.6% of lecturers disagree with this statement, while 12.7% of students and 9.9% of lecturers remain neutral. Mean scores further support this trend, with students averaging 4.25 and lecturers averaging 4.1. These findings suggest a strong VL endorsement among students and lecturers in the northern zone of Tanzania. This sentiment aligns with the findings of John (2021), where students reported high satisfaction with the flexibility of VL but noted poor internet access as a barrier. Lecturers found that transitioning to virtual platforms increased workload and required more support, thus supporting the current findings. The positive attitudes of students and lecturers on recommending VL imply that most students perceive virtual learning as a commendable educational approach.

These findings suggest that despite the prevalent reluctance among some lecturers towards new learning tools, there is a noticeable shift in perception, particularly among the younger generation. One informant, DVC3, highlighted this change, noting, "So, despite its advantages in meeting the necessity of both lecturers and students, still there are lecturers who have a negative attitude towards VL platforms/ systems, and most of them are old lecturers, but this young generation, they really prefer this kind of learning" (DVC3; personal communication on 19th December 2023). This shift in viewpoint resonates with the results from Jabali (2022) in Saudi Arabia, which underscored the differences in how students and lecturers perceive and utilize e-learning tools. The findings suggest that younger students are more favourable to these platforms than their older counterparts. This trend points to a gradual yet significant embrace of innovative learning approaches among the younger population in academic environments, indicating a growing acceptance and preference for modern educational methodologies.

Most students and lecturers find multimedia elements in virtual classes to contribute to an enjoyable learning experience, with 70.2% of students and 84.5% of lecturers agreeing. However, only 15.6% of students and 2.8% of lecturers disagree with this statement, while 14.0% of students and 12.7% of lecturers remain neutral. Mean scores further support this development, with students averaging 3.92 and lecturers averaging 3.10. These findings suggest that students and lecturers perceive multimedia elements in virtual classes as integral to an enjoyable learning experience. This assertion is reinforced by the research conducted by Belkhou and Ghalmat (2023) in Morocco, which revealed that professors maintained a favorable view of online learning, even when faced with technical difficulties, suggesting that they found the experience rewarding. Additionally, the research indicates that students and lecturers value multimedia components in virtual classes, suggesting that these elements are essential for creating a pleasurable and enriching learning environment.

Most students and lecturers exhibit a positive attitude towards VL overall, with 82% of students and 88.7% of lecturers agreeing. On the other hand, only 5.1% of students and 5.6% of lecturers disagree with this statement, while 12.9% of students and 5.6% of lecturers remain neutral. Mean scores further support this development, with students averaging 4.14 and lecturers averaging 4.30. These findings suggest a widespread positivity towards virtual learning among students and lecturers in the northern zone of Tanzania. This sentiment is also supported by Hollister et al. (2022), who found that students were comfortable engaging in online classes, signifying a generally positive perception of virtual learning. The widespread positivity among students and lecturers towards virtual learning implies that students consider VL as an effective and appealing mode of education.

Many students and lecturers perceive VL tools as user-friendly and easy to navigate, with 65.8% of students and 67.6% of lecturers agreeing. In contrast, only 8.9% of students and 9.8% of lecturers disagree with this statement, while 25.2% of students and 22.5% of lecturers remain neutral. Mean scores further support this trend, with students averaging 3.84 and lecturers averaging 2.8. These findings suggest that students and lecturers find VL platforms accessible and conducive to their learning journey. This sentiment aligns with the findings of Jabali (2022) in Saudi Arabia, who reported that most students found the utilization of learning management systems to be effective in enabling the accessibility of course materials. A considerable percentage of students and lecturers perceive virtual learning platforms as user-friendly, implying that they find these platforms accessible and conducive to their learning journey.

Many students and lecturers perceive VL as offering flexibility in managing their schedules, with 77.4% of students and 76.1% of lecturers agreeing. On the other hand, only 8.3% of students and 5.6% of lecturers disagree with this statement, while 14.2% of students and 18.3% of lecturers remain neutral. Mean scores further support this trend, with students averaging 3.99 and lecturers averaging 4.00. These findings suggest that students and lecturers perceive virtual learning as flexible, allowing them to conduct learning or teaching without time constraints. This sentiment aligns with Salas-Pilco, Yang, and Zhang's (2022) findings in Latin American universities, where students acknowledged the ease and flexibility of online learning. A considerable percentage of students recognize flexibility in schedule management through VL, which implies that students value the adaptability offered by this learning mode.

The overall mean scores across the statements related to VL perceptions were 3.98 and 3.97 for students and lecturers, respectively. These values indicate positive perceptions among university students and lecturers towards implementing virtual learning. These findings align with various studies, such as Mutalib et al. (2022), which reported positive perceptions of online learning among students, and Salema (2023) in Tanzania, highlighting positive perceptions among lecturers and students towards online teaching and learning. The overall mean score signifies a widespread positive inclination towards VL among university students and lecturers, indicating a collective acceptance and favorable attitude towards its implementation in Tanzanian universities.

The positive perceptions of VL among both students and lecturers were also noticed, as expressed by key informants. One informant, DVC1, highlighted the students' affirmative viewpoint: "With the students, you know it is positive, they have a positive perception" (DVC1; personal communication 28th November 2023). This response was further supported by another key informant, SA1, who emphasized the positive perception despite potential challenges: "...yes, like internet, like financial poster because computers and other issues might be a challenge but they perceive positively" (SA1; personal communication on 28th November 2023). Responses from the key informants show positive perceptions of students and lecturers towards implementing VL in the universities. These findings align with the findings by Belkhou and Ghalmat (2023) in Morocco, which showed positive perceptions among university professors toward online learning. Similarly, Dangaiso et al. (2022) in Zimbabwe indicated a strong positive relationship between perceived e-learning service quality and student satisfaction, emphasizing the significant role of positive perceptions in enhancing student engagement and loyalty to e-learning tools. This implies that having positive perceptions towards VL can act as an impetus towards implementing VL. Thus, the moderate level of implementing VL, as observed in the first research questions, might also be attributed to other factors apart from students' and lecturers' perceptions.

The response from the System Administrator indicates a positive perception towards VL, voiced as follows: *Generally, students articulated a positive perception towards VL, often citing its convenience, flexibility, and engaging content. This positive perception is crucial for VL initiatives' continued adoption and success. On the same lens, our lecturers and university management appreciate the university's digital era and VL initiatives (System Administrator, personal communication, 18th November 2023).*

Likewise, on the same theme regarding the perceptions of VL initiatives, another DVC Academics Affairs commented that:

There is a positive mindset towards VL, as revealed by a positive perception among students and lecturers. Consequently, as a university, we emphasize developing digital skills through VL, preparing students for the demands of the modern workforce. Our pride is in nurturing graduates who meet market demand requirements (DVC Academics Affairs, personal communication, 29th November 2023).

The qualitative findings reveal a strong endorsement of virtual learning (VL) among both lecturers and students, indicating that it is held in comparable esteem to traditional in-person degree programs. Consequently, their overall attitudes towards VL are highly positive. This reflects an acknowledgement of the legitimacy and credibility of online education, likely influenced by advancements in technology, enhanced course design, and successful outcomes from current virtual learning initiatives. Additionally, respondents preferred VL, viewing it as the future direction of global educational trends. This underscores a belief in the effectiveness and impending prominence of virtual learning. Furthermore, the data suggests that the transition to VL is an inevitable evolution in the educational landscape, driven by technological innovations and shifting educational paradigms, making it a necessary change rather than a mere option. A significant advantage highlighted is the potential for reduced educational costs, particularly in student commuting expenses, the need for large lecture halls, and increased scalability for lecturers.

The researcher tested a hypothesis to find whether the observed difference among the obtained mean scores was significant. The researcher conducted an independent sample t-test at a 95% confidence level to achieve this.

- Null Hypothesis: There is no statistically significant difference in university students' and lecturers' perception mean scores towards virtual learning.

The results of hypothesis testing are presented in table 2.

	Levene's Test for Equality of Variances		t-test for Equality of Means				
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Equal variances assumed	2.452	0.135	-.691	18	.499	-.0630	.0912
Equal variances are not assumed.			-.691	14.80	.500	-.0630	.0912

Table 2: Results of Hypothesis Two
Source: Field Data (2023)

The homogeneity test yielded positive outcomes (Levene's Test for Equality of Variances: $F = 2.452$, $p = 0.135$), indicating that the variances were relatively uniform, thereby supporting the assumption of equal variances. Subsequent analysis with the t-test for Equality of Means showed no significant statistical difference between the average scores of students and lecturers ($t = -0.691$, $df = 18$, $p = 0.499$).

Although the mean score for lecturers (4.04) was higher than that of students (3.98), the lack of statistical significance ($p > 0.05$) signifies that this difference was not substantial. This suggests that both students and lecturers perceived virtual learning positively, consistent with Belkhou and Ghalmat (2023), who highlighted professors' positive attitudes towards online learning. Despite a slightly higher mean score for lecturers, the similarity in perception between students and lecturers reinforces the consensus that both groups viewed VL favourably, fostering a positive learning environment.

Furthermore, key informants highlighted the collective perception of lecturers and students endorsing VL positively, emphasizing its role in enhancing educational experiences. Informants acknowledged challenges related to infrastructure and digital accessibility but highlighted the overarching positive perception. One informant, DVC2, mentioned, *"...but the real perception is positive because they see it enhances learning to students and some students can access their lecturers"* (DVC2; personal communication November 29th 2023), underlining the perceived benefits of virtual learning. This sentiment aligns with the findings by Salema (2023) in Tanzania, where both lecturers and students displayed a positive stance toward online teaching and learning. Moreover, key informants consistently emphasized lecturers' and students' enduring positive stance toward virtual learning, particularly when circumstances remain stable. One informant, DVC4, remarked, *"I think that if other factors remain constant, lecturers and students are positively perceiving this technology"* (DVC4; personal communication 21st 2023), highlighting the sustained positivity under favorable conditions. These findings also agree with Mahali et al. (2019), who reported a significant and positive correlation between the attitudes of students and lecturers and the utilization of learning management systems.

The data from interviews generally show a positive perception among students and lecturers regarding the implementation of VL, which is evident in their affirmative outlook and endorsement of its benefits. This collective positivity signifies a shift in attitudes, notably among the younger demographic, indicating a growing acceptance of innovative learning methodologies within academic settings. Despite challenges related to infrastructure and digital accessibility, both students and lecturers consistently express an overarching positive sentiment towards VL. This aligns with previous research findings highlighting a positive stance among university professors and students toward online learning, emphasizing its role in enhancing educational experiences. This sustained positivity, particularly when circumstances remain stable, underscores the inclination toward embracing technological advancements in education and signifies a promising trajectory toward increased acceptance and utilization of virtual learning platforms. The qualitative findings also affirm the quantitative data, whereby students and lecturers demonstrated positive perceptions of implementing VL in the questionnaires.

9. Conclusion and Recommendations

In summary, based on the study's findings, it was concluded that lecturers and students within the Northern zone of Tanzania demonstrate positive perceptions of implementing VL platforms in universities. The absence of significant differences between their perceptions suggests a shared willingness to embrace technological advancements in education. These findings highlight the potential for virtual learning to enhance educational experiences and foster a dynamic learning environment within the region.

Based on the conclusions of the study, the following recommendations were made.

- University management should improve the technological infrastructure by ensuring reliable internet connectivity, upgrading software and platforms, and providing technical support services. This can promote positive perceptions among lecturers and students towards implementing VL in the universities.
- Policymakers should allocate resources and implement policies that promote accessibility and affordability of digital resources and internet connectivity. This can foster positive perceptions towards implementing VL among students and lecturers.

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