IARJSET

ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Impact Factor 8.066 ⁜ Peer-reviewed & Refereed journal ⁜ Vol. 11, Issue 7, July 2024

DOI: 10.17148/IARJSET.2024.11718

COMPARATIVE STUDY OF THE AVAILABILITY AND UTILIZATION OF E-LEARNING INFRASTRUCTURE IN FEDERAL AND STATE TERTIARY INSTITUTIONS IN KEBBI STATES, NIGERIA.

Dami Saley Dabai[1], Samira Kabir Nabade[2], Isma'il Aliyu B[3]

Centre for Information Technology, Kebbi State Polytechnic, Dakingari[1-3]

Abstract: This study examines the differences in e-learning infrastructure between federal and state tertiary institutions in Kebbi State, Nigeria. A structured questionnaire, distributed to 180 respondents across nine institutions, gathered data on the availability, accessibility and utilization of e-learning tools. SPSS was used for data analysis, employing simple frequency counts and a 4-point Likert scale to answer research questions. Results indicate that federal institutions have significantly better e-learning infrastructure compared to state institutions. Federal institutions reported higher availability and accessibility of internet services, digital resources and computers. They also had better-equipped virtual learning facilities and superior technical support. In contrast, state institutions showed lower and more inconsistent usage of e-learning tools among lecturers and students. Resource availability and ease of access were key factors influencing e-learning adoption. Positive perceptions of e-learning effectiveness were noted, but infrastructure limitations and funding constraints were major barriers. Recommendations for improvement included increased investment and faculty development programs. Independent samples t-tests confirmed a significant difference in the mean availability of e-learning infrastructure between federal and state institutions, with federal institutions having a clear advantage. This study underscores the need for enhanced e-learning infrastructure in state institutions to improve adoption and effectiveness.

Keywords: Availability, Accessibility, Usage, E-learning infrastructure, Tertiary institutions

I. INTRODUCTION

Advancements in computer and communication technology have created a wealth of opportunities for electronic learning (Rozina, 2002). By enabling distant exchanges and collaboration, new multimedia technologies and the internet improve the accessibility, effectiveness and quality of learning, turning e-learning into a paradigm and philosophy in education. Internet technologies have many prospects for advancement, especially in the areas of education, teaching, research and learning, Manir (2007). By accelerating knowledge flows, overcoming information and material access gaps and bringing cutting-edge educational models to remote locations, wireless internet technologies have the potential to significantly enhance education in poor nations.

Nigeria, the most populous nation in Africa, has a growing youth population and limited resources and infrastructure deficits, making it extremely difficult to provide them with a high-quality education. It has been acknowledged that implementing e-learning infrastructure in Nigerian tertiary institutions could help solve these issues by increasing educational access, boosting flexibility in the learning process and raising academic standards.

In an era characterized by rapid technological advancement and the globalization of education, the integration of e-learning infrastructure has emerged as a critical component in tertiary education systems worldwide. In Nigeria, as in many other countries, the adoption of e-learning technologies holds the promise of expanding access to education, improving learning outcomes and fostering innovation in teaching and learning practices.

IARJSET

ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Impact Factor 8.066 ⁜ Peer-reviewed & Refereed journal ⁜ Vol. 11, Issue 7, July 2024

DOI: 10.17148/IARJSET.2024.11718

While the potential benefits of e-learning infrastructure are evident, disparities may exist in the availability and utilization of these technologies across different tiers of the Nigerian education system. Federal and state tertiary institutions, which represent distinct administrative and funding structures, may face unique challenges and opportunities in implementing e-learning initiatives. This research aims to conduct a comparative analysis of the availability and utilization of e-learning infrastructure in Federal and state tertiary institutions in Kebbi State, Nigeria. By examining the disparities, challenges and opportunities associated with e-learning adoption across different institutional contexts, this study seeks to inform policy formulation, resource allocation and strategic planning efforts aimed at enhancing the effectiveness and inclusivity of e-learning initiatives in Kebbi State and beyond.

Rosenberg (2001) defines e-learning as a networked phenomenon allowing for instant revisions and distribution. E-learning, delivered using standard Internet technology, offers cost-effectiveness, responsiveness to change, consistency, timely content, flexible accessibility, and customer value. Organizations must build a strategic foundation for e-learning, addressing emerging approaches and synthesizing other learning efforts. For the implementation of e-learning to be beneficial, its benefits must exceed its drawbacks. One of the many benefits of e-learning is its lower cost of delivery. Learners may work at their own pace, access consistent content at any time and from any location, all thanks to e-learning. With the use of audio, video, quizzes, and other interactive elements, the easily updated educational materials facilitate the usage of multimedia and reinforce learning. E-learning has the potential to enhance retention, offer prompt feedback, and enable learners to personalize learning resources to suit their specific requirements (Kirsh, 2002; Turk and Robertson, 2000).

Folorenso, Ogunseye, and Sharma (2006) carried out an expository study of the critical factors affecting the acceptability of e-learning in Nigerian University, they discovered that the adoption of e-learning at Federal and State Universities is significantly impacted by three key factors: low literacy, high cost and mass unawareness.

In another e-learning related study conducted by Atsumbel and *etal.* (2012) on the availability and utilization of e-learning infrastructure at Federal University of Technology, Minna. They discovered that e-learning infrastructure is not available at FUT, Minna. Therefore, in order to proffer solutions to the issues facing education today, they suggested that ICT infrastructure be provided to enable effective teaching and learning.

Nbina, Obomanu, and Vikoo (2011) investigated how Rivers State University of Education in Port Harcourt used information and communication technology for high-quality instruction; they discovered that instructors were reluctant to use it because they were unfamiliar with its resources. Kamba (2009) conducted a study titled "Problems, Challenges, and Benefits of Implementing e-Learning in Nigerian Universities" and discovered that these institutions are increasingly developing websites intended more for campus marketing than for e-learning purposes. Similar to this, Piranis' (2004) study on supporting e-learning in higher education: road map, tools for navigating complex decision made clear that an institution needs to have a sufficient and dependable technical infrastructure in place before it can implement e-learning.

To the best of the researchers' knowledge, no study has been done to comparatively study the availability and utilization of e-learning infrastructure in federal and state tertiary institutions in Kebbi State, Nigeria. This gives this study credibility in an effort to close the perceived knowledge gap.

II. STATEMENT OF THE PROBLEM

The integration of e-learning infrastructure in tertiary education has become increasingly pivotal in fostering accessible and quality education, particularly in regions like Kebbi State, Nigeria. However, disparities may exist in the availability and utilization of e-learning resources between federal and state tertiary institutions, potentially influencing educational outcomes and opportunities for students and faculty. Despite the recognized importance of e-learning, a comprehensive comparative analysis of e-learning infrastructure across federal and state tertiary institutions in Kebbi State remains understudied. The lack of empirical evidence regarding the extent of e-learning infrastructure disparities between federal and state institutions hampers informed decision-making and resource allocation strategies aimed at enhancing educational technology adoption and effectiveness. Additionally, understanding stakeholder perceptions and experiences regarding e-learning is crucial for addressing barriers and fostering a conducive environment for e-learning implementation and utilization. Therefore, there is a pressing need for a systematic investigation into the availability, utilization, and perceptions of e-learning infrastructure in federal and state tertiary institutions in Kebbi State, Nigeria. Such a study will not only shed light on existing disparities and challenges but also provide insights into potential strategies for promoting equitable access to quality e-learning resources and enhancing educational outcomes across diverse institutional settings.

IARJSET

ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Impact Factor 8.066 ⁜ Peer-reviewed & Refereed journal ⁜ Vol. 11, Issue 7, July 2024

DOI: 10.17148/IARJSET.2024.11718

III. OBJECTIVE OF THE STUDY

The main aim of this research work is to carry out a comparative study of the availability and utilization of e-learning infrastructure in Federal and State Tertiary Institutions in Kebbi States, Nigeria. The objectives of the research work are itemized below:

1. To identify and comp are the availability of e-learning infrastructure between Federal and State Tertiary Institutions in Kebbi State.
2. To examine the extent to which e-learning tools and platforms are utilized in Federal and State Tertiary Institutions.
3. To explore the perceptions, attitudes and experiences of stakeholders regarding e-learning in Federal and State Tertiary Institutions.
4. To Formulate evidence-based recommendations to stakeholders in Kebbi State based on the findings of this study.

IV. RESEARCH QUESTION

The following research questions guide this study.

1. What are the differences in the availability and accessibility of e-learning infrastructure between federal and state tertiary institutions in Kebbi State?
2. How are e-learning tools and platforms utilized in federal and state tertiary institutions in Kebbi State?
3. What are the perceptions, attitudes and experiences of stakeholders regarding e-learning in federal and state tertiary institutions in Kebbi State
4. What recommendations can be formulated from the findings of this study to promote effective utilization of e-learning infrastructure in tertiary institutions in Kebbi State Nigeria?

V. RESEARCH HYPOTHESIS

The following null hypothesis are formulated and tested in this research work at 0.05 level of significance.

H_{o1}: There is no significant difference in the mean availability of e-learning infrastructure between federal and state tertiary institutions in Kebbi State.

H_{o2}:There is no significant difference in the mean utilization of e-learning tools and platforms between federal and state tertiary institutions in Kebbi State.

VI. RESEARCH METHODOLOGY

The research methodology for this study involved a quantitative approach, utilizing a structured questionnaire to collect data from respondents across nine tertiary institutions in Kebbi State, Nigeria. The institutions included in the study were both federal and state tertiary institutions, ensuring a comprehensive comparison. A total of 20 questionnaires were distributed to each of the nine institutions, resulting in a total of 180 questionnaires. The questionnaire, containing 20 items, was administered to both students and lecturers within the study area. Data analysis was performed using Statistical Package for Social Sciences (SPSS).

Research questions 1, 3 and 4 were answered using simple frequency counts, which allowed for a straightforward interpretation of the data by highlighting the distribution and frequency of responses. Research question 2 was answered using a modified 4-point Likert scale to measure the extent of various factors, with the scale including Very High Extent (VHE) at 4 points, High Extent (HE) at 3 points, Low Extent (LE) at 2 points and Very Low Extent (VLE) at 1 point.

The mean of the weighted points was calculated, with decisions based on the computed mean, interpreted as follows: 3.00 and above for Very High Extent (VHE), 2.50-2.99 for High Extent (HE), 2.49-1.75 for Low Extent (LE), and 1.74-0.00 for Very Low Extent (VLE).The hypothesis was tested using an independent samples t-test, which involved computing a composite variable response from the relevant questionnaire items.

This t-test allowed for determining whether there were significant differences in the mean availability and utilization of e-learning infrastructure between federal and state tertiary institutions in Kebbi State.

ISSN (O) 2393-8021, ISSN (P) 2394-1588

IARJSET

International Advanced Research Journal in Science, Engineering and Technology

Impact Factor 8.066 ⁜ Peer-reviewed & Refereed journal ⁜ Vol. 11, Issue 7, July 2024

DOI: 10.17148/IARJSET.2024.11718

VII. RESULT

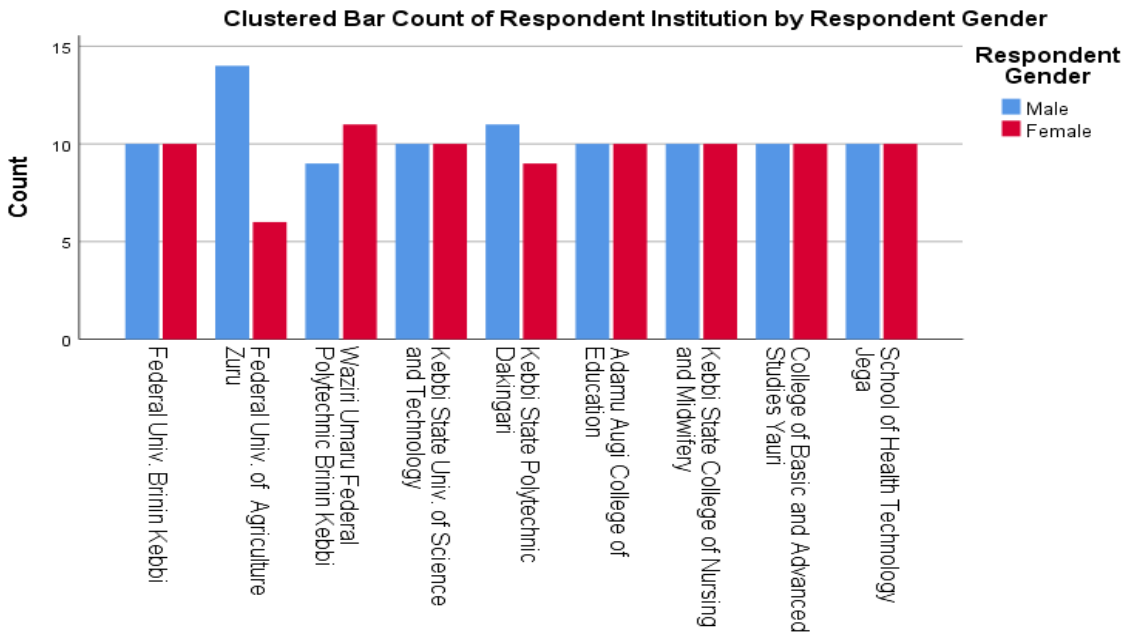

Figure 1 Respondent Gender

Figure 1 above shows the distribution of the respondents across the tertiary institutions in Kebbi State in terms of Gender.

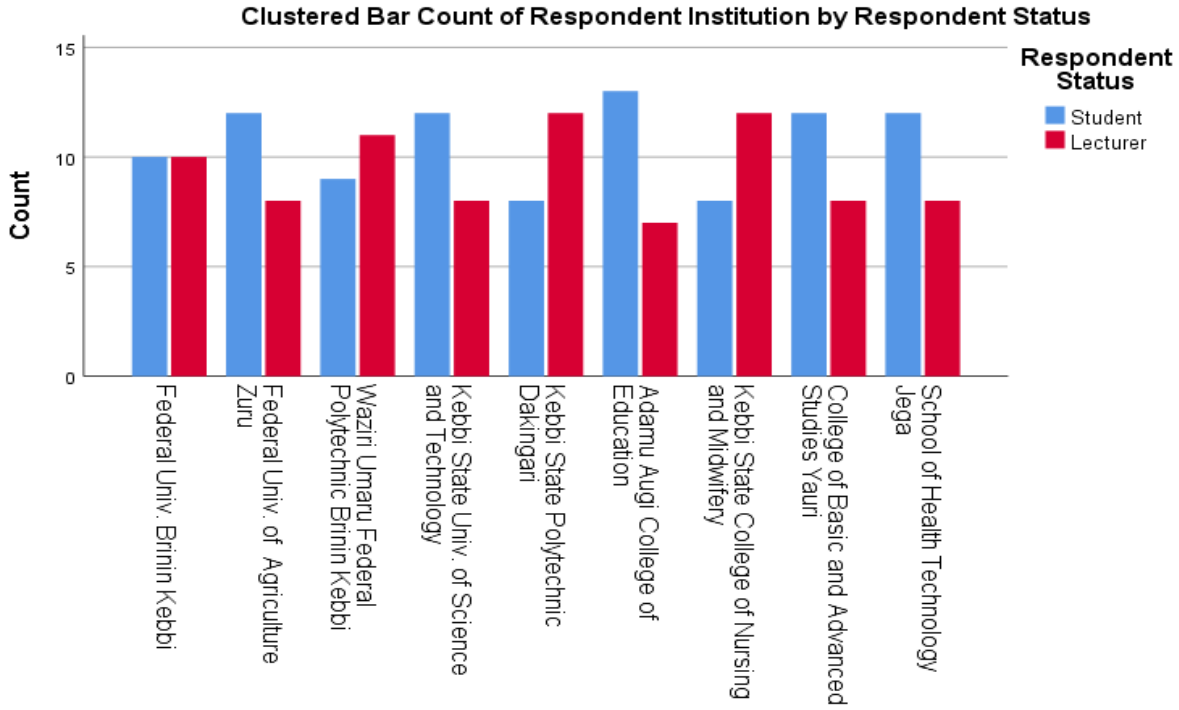

Figure 2 Respondent Status

Figure 2 above shows the status of the respondents who participated in the study across the investigated tertiary institutions.

IARJSET

ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Impact Factor 8.066 ⁜ Peer-reviewed & Refereed journal ⁜ Vol. 11, Issue 7, July 2024

DOI: 10.17148/IARJSET.2024.11718

Table 1 (RQ1):Differences in the availability and accessibility of e-learning infrastructure

		Federal	Percentage (%)	State	Percentage (%)	Total
Reliability of Internet Services	Not Available	0	0	47	39.17	47
	Fair	22	36.66	37	30.83	59
	Good	38	63.34	22	18.33	60
	Excellent	0	0	14	11.67	14
Total		60	100	120	100	180
		Federal	Percentage (%)	State	Percentage (%)	Total
Availability of Digital Resources	Scarce	0	0	59	49.17	47
	Insufficient	21	35.0	27	22.5	59
	Adequate	39	65.0	20	16.67	60
	Excellent	0	0	14	11.66	14
Total		60	100	120	100	180
		Federal	Percentage (%)	State	Percentage (%)	Total
Ease of Accessing Computers or Laptops	Very Difficult	0	0	9	7.5	9
	Some What Difficult	22	36.66	54	45	76
	Some What Easy	38	63.34	30	25	68
	Very Easy	0	0	27	22.5	27
Total		60	100	120	100	180
		Federal	Percentage (%)	State	Percentage (%)	Total
Availability of Educational Media for E- learning such as videos & simulator	Scarce	0	0	40	33.33	40
	Insufficient	23	38.33	54	45	77
	Adequate	37	61.67	26	21.66	63
Total		60	100	120	100	180
		Federal	Percentage (%)	State	Percentage (%)	Total
Provision of Virtual Learning Facilities	Not Equipped	1	1.67	1	0.84	2
	Limited	1	1.67	74	62.18	75
	Partially Equipped	23	38.33	36	30.25	59
	Fully Equipped	35	58.33	8	6.73	43
Total		60	100	119	100	179
		Federal	Percentage (%)	State	Percentage (%)	Total
Extent of Technical Support Services	Limited	0	0	40	33.34	40
	Adequate	23	38.33	54	45	77
	Exceptional	37	61.67	26	21.66	63
Total		60	100	120	100	180
		Federal	Percentage (%)	State	Percentage (%)	Total
Accessibility of Educational Materials and Links	Not Accessible	1	1.67	15	12.6	16
	Somewhat Accessible	20	33.33	20	16.80	40
	Moderately Accessible	18	30	75	63.02	93
	Extremely Accessible	21	35	9	7.56	30
Total		60	100	119	100	179

The data from table 1 above reveals notable differences in the availability and accessibility of e-learning infrastructure between federal and state tertiary institutions. Federal institutions have a higher percentage of respondents rating their internet services as "Good" (63.34%) compared to state institutions (18.33%). Similarly, digital resources are considered "Adequate" by 65% of respondents from federal institutions, whereas 49.17% of state institution respondents find them "Scarce."

IARJSET

ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Impact Factor 8.066 ⁜ Peer-reviewed & Refereed journal ⁜ Vol. 11, Issue 7, July 2024

DOI: 10.17148/IARJSET.2024.11718

Access to computers or laptops is reported as "Somewhat Easy" by 63.34% of federal institution respondents, while 45% of state institution respondents find it "Somewhat Difficult." Additionally, federal institutions are better equipped with virtual learning facilities, with 58.33% of their respondents reporting being "Fully Equipped," in contrast to only 6.73% from state institutions.

Finally, technical support services are rated as "Exceptional" by 61.67% of respondents from federal institutions, compared to 21.66% from state institutions, indicating a significant disparity in support availability.

Table 2 (RQ2): Utilization of e-learning tools and platforms in federal and state tertiary institutions

Federal or State		Usage of E-learning infrastructure by students & lecturers to maintain regular communication	Usage of E-learning infrastructure by students & lecturers for Online discussion & virtual lecture	Deployment of Computer Applications for Teaching & Learning by Lecturers	Usage of Computer Simulation to aid teaching & learning	Level of Usage of additional resources such as online libraries and multimedia by students	Extent of Usage of Electronic devices by Lecturers to facilitate student retention	Frequency of using E-learning tools & platform for academic activities
Fed.	Mean	2.68	2.65	2.62	2.55	2.62	2.67	2.75
	N	60	60	60	60	60	60	60
	Std.	.504	.481	.524	.502	.524	.475	.628
	Decision	HE	HE	HE	HE	HE	HE	HE
State	Mean	1.90	1.79	2.13	1.74	1.95	2.17	1.24
	N	120	120	119	119	120	120	120
	Std.	.691	.755	.907	.644	.942	.403	.502
Total	Mean	2.16	2.08	2.29	2.01	2.17	2.34	1.74
	N	180	180	179	179	180	180	180
	Std. Deviation	.734	.787	.831	.711	.883	.486	.898
	Decision	LE	LE	LE	LE	LE	LE	VLE

Analysis of data from table 2 above, reveals that federal tertiary institutions in Kebbi State have a significantly higher extent of e-learning infrastructure usage across all measured categories compared to state institutions. Federal institutions consistently report "High Extent" usage for communication, online discussions, deployment of computer applications and usage of simulations, with mean scores above 2.50.

In contrast, state institutions generally fall into the "Low Extent" or "Very Low Extent" categories, with mean scores mostly below 2.50, indicating limited use of e-learning tools. However, higher standard deviations in state institutions suggest greater inconsistency in e-learning infrastructure usage, implying that the responses from state institution participants show more variability around the mean compared to those from federal institutions. This indicates that students and lecturers at state institutions experience a wider range of access and usage levels for e-learning tools and platforms. In contrast, the lower standard deviations in federal institutions imply that the experiences of students and lecturers are more uniform and consistent.

Table 3 (RQ3): Perceptions, attitudes and experiences of stakeholders regarding e-learning

		Frequency	Percentage (%)
Factors influencing decision to use E-learning	Ease of Access	24	13.3
	Availability of Resources	150	83.3
	Total	174	96.7
	(Missing) System	6	3.3
Total		180	

IARJSET

ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Impact Factor 8.066 ⁜ Peer-reviewed & Refereed journal ⁜ Vol. 11, Issue 7, July 2024

DOI: 10.17148/IARJSET.2024.11718

		Frequency	Percentage (%)
Perception regarding the effectiveness of E- learning in teaching & learning	Ineffective	50	27.8
	Neutral	24	13.3
	Somewhat Effective	105	58.3
	Total	179	99.4
	(Missing) System	1	.6
Total		180	
		Frequency	Percentage (%)
Barrier faced in adopting E-learning	Infrastructure limitation	135	75.0
	Resistant from faculty/students	3	1.7
	Lack of Training	28	15.6
	Technological issues	14	7.8
Total		180	100
		Frequency	Percentage (%)
Challenges in implementing E-learning Infrastructure	Lack of Technical Expertise	22	12.2
	Funding Constraints	157	87.2
	Total	179	99.4
	(Missing) System	1	.6
Total		180	100

The data from table 3 above indicates that the primary factors influencing the decision to use e-learning are the availability of resources (83.3%) and ease of access (13.3%), highlighting that resources are the most critical factor. Perceptions regarding the effectiveness of e-learning are largely positive, with 58.3% finding it somewhat effective, although 27.8% still consider it ineffective.

The major barriers to adopting e-learning are infrastructure limitations (75.0%) and funding constraints (87.2%), suggesting significant challenges in resources and financial support.

Table 4 (RQ4): Recommendations to promote effective utilization of e-learning

		Frequency	Percent
Ways of enhancing e-learning	Student involvement in planning	7	3.9
	Faculty development programs	35	19.4
	Increase investment	137	76.1
	Total	179	99.4
Missing	System	1	.6
Total		180	100.0

The data in table 4 above shows that the predominant recommendation to promote effective utilization of e-learning is to increase investment, with 76.1% of respondents suggesting this as a priority.

Faculty development programs are also considered important by 19.4% of respondents, indicating a need for training and support for educators. Student involvement in planning is recommended by 3.9% of respondents, reflecting a lesser but still notable interest in engaging students in the development of e-learning strategies.

Overall, the emphasis on investment and faculty development highlights the need for resources and training to enhance e-learning effectiveness.

IARJSET

ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Impact Factor 8.066 ⁜ Peer-reviewed & Refereed journal ⁜ Vol. 11, Issue 7, July 2024

DOI: 10.17148/IARJSET.2024.11718

Table 5: T- Test of H_{o1}

Group Statistics									
Federal or State	N		Mean			Std. Deviation		Std. Error Mean	
Federal	60		2.8762			.37610		.04855	
State	120		2.3009			.62985		.05750	
Independent Samples Test									
	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	95% Confidence Interval of the Difference	
								Lower	Upper
Equal variances assumes	7.527	.007	6.513	178	.000	.57530	.08833	.40099	.74961
Equal variances not assumes			7.645	172.404	.000	.57530	.07526	.42676	.72384

Table 5 above is the result of independent sample t-test conducted on hypothesis one (H_{o1}).The p-value of .007 is less than the assumed significance level of 0.05, we reject equal variances between the two groups and use the result under equal variance not assumed.t = 7.645, df = 172.404, p < .001. Since p-value is less than .05, we reject the null hypothesis (H_{01}).Therefore, there is a significant difference in the mean availability of e-learning infrastructure between federal and state tertiary institutions in Kebbi State. The mean availability of e-learning infrastructure in federal institutions is significantly higher by approximately 0.575 units compared to state institutions.

Table 6: T- Test of H_{o2}

Group Statistics									
Federal or State	N		Mean			Std. Deviation		Std. Error Mean	
Federal	60		2.6476			.47232		.06098	
State	120		1.8468			.50524		.04612	
Independent Samples Test									
	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	95% Confidence Interval of the Difference	
								Lower	Upper
Equal variances assumes	.003	.959	10.240	178	.000	.80079	.07820	.64648	.95511
Equal variances not assumes			10.474	125.464	.000	.80079	.07645	.64949	.95210

Table 6 above is the result of independent sample t-test conducted on hypothesis two (H_{o2}).The p-value of .0959 is greater than the assumed significance level of 0.05, we accept equal variances between the two groups and use the

IARJSET
ISSN (O) 2393-8021, ISSN (P) 2394-1588
International Advanced Research Journal in Science, Engineering and Technology
Impact Factor 8.066 ⁜ Peer-reviewed & Refereed journal ⁜ Vol. 11, Issue 7, July 2024
DOI: 10.17148/IARJSET.2024.11718

result under equal variance assumed.t = 10.240, df = 178, p < .001. Since p-value is less than .05, we reject the null hypothesis (H_{02}). Therefore, there is a significant difference in the mean utilization of e-learning tools and platforms between federal and state tertiary institutions in Kebbi State. The mean utilization of e-learning infrastructure in federal institutions is significantly higher by approximately .80079units compared to state institutions.

VII. DISCUSSION OF FINDINGS

The analysis reveals significant differences in both the availability and utilization of e-learning infrastructure between federal and state tertiary institutions in Kebbi State. Federal institutions generally offer better e-learning resources, with more respondents rating their internet services as "Good," digital resources as "Adequate," and access to computers as "Somewhat Easy" compared to state institutions. Additionally, federal institutions are better equipped with virtual learning facilities and provide more exceptional technical support services.Usage of e-learning infrastructure also differs notably between the two types of institutions. Federal institutions report a higher extent of usage across various e-learning activities, including communication, online discussions and deployment of computer applications. In contrast, state institutions show limited usage of these tools. The higher variability in responses from state institutions suggests inconsistent access and usage levels between students and lecturers, while federal institutions demonstrate more uniform and consistent experiences.The independent samples t-test results further support these observations, indicating significant differences in both the availability and utilization of e-learning infrastructure between federal and state institutions. For availability, the p-value of less than .001 confirms a significant difference, with federal institutions having a higher mean availability by approximately 0.575. Similarly, the mean utilization of e-learning tools is significantly higher in federal institutions by approximately 0.80079, reinforcing the disparity between the two groups.

VIII. CONCLUSION

The study reveals significant disparities in the availability, accessibility and usage of e-learning infrastructure between federal and state tertiary institutions in Kebbi State. Federal institutions exhibit higher levels of e-learning infrastructure and resources, including better internet services, digital resources and access to computers and laptops. These institutions also demonstrate greater consistency in the utilization of e-learning tools and platforms. In contrast, state institutions face notable challenges in these areas, showing greater variability in infrastructure usage and encountering significant barriers such as infrastructure limitations and funding constraints. The independent samples t-test results confirm a statistically significant difference in the mean availability and utilization of e-learning infrastructure between federal and state institutions, with federal institutions consistently outperforming their state counterparts. These findings underscore the need for targeted interventions to bridge the e-learning infrastructure gap and promote equitable access to digital education resources across all tertiary institutions in Kebbi State
.

IX. RECOMMENDATION

- **Increased Investment:** There is a critical need for increased investment in e-learning infrastructure, particularly in state tertiary institutions to ensure equitable access to digital education resources.
- **Improvement in Technical Support:** Enhanced technical support services should be provided in state institutions to address the significant disparity in support availability and improve the overall e-learning experience.
- **Faculty Development Programs:** Implementing comprehensive faculty development programs focused on e-learning tools and methodologies can help educators effectively integrate digital resources into their teaching practices.
- **Infrastructure Upgrades:** Upgrading the existing infrastructure in state institutions, including internet services and access to digital resources is essential to support effective e-learning.
- **Policy and Funding Support:** Policymakers should allocate dedicated funding to address the infrastructure and financial constraints faced by state institutions, promoting a more balanced and effective use of e-learning across all tertiary institutions.
- **Student Involvement:** Engaging students in the planning and development of e-learning strategies can provide valuable insights and ensure that the implemented solutions meet their needs and preferences.

ACKNOWLEDGMENT

This work was supported financially by the Tertiary Education Trust Fund (TETFUND), Nigeria and technically by the Department of Centre for Information Technology, Kebbi State Polytechnic Dakingari and the institutions of higher of learning in Kebbi state, Nigeria.

IARJSET

ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Impact Factor 8.066 ⁜ Peer-reviewed & Refereed journal ⁜ Vol. 11, Issue 7, July 2024

DOI: 10.17148/IARJSET.2024.11718

REFERENCES

[1]. Rozina I. (2002) Theory and Practice of Computer-assisted Communication in Russia: Present-day Situation and Future Perspectives. In: Theory of Communication and Applied Communication. *Journal of Russian Communication Association. Issue 1*

[2]. Manir, A.K. (2007) Availability and Utilization of the Internet for Academic Activities in selected federal universities in Northern Nigeria. Master thesis unpublished.

[3]. RosenbergM. (2001). E-Learning: Strategies for DeliveringKnowledge in the Digital Age New York, NY: McGraw-Hill Companies, Inc.

[4]. Kirsh, D. (2002). E-learning, metacognition and visual design paper presented at the International Conference on Advances in Infrastructure for e-Business, e-Education, e-Science, and e- Medicine on the internet, L'Aquila, Italy.

[5]. Robertson, G. &Turk M. (2000). Perceptual user interfaces. *Communications of the ACM*, Vol. 43 No.2, pp.3

[6]. Folorenso, O., Ogunseye, O. S & Sharma, S.K., (2006). An expository study of the critical factors affecting the acceptability of e-learning in Nigerian University. Information Management and Computer Securities, 14 (5), 496 – 505.

[7]. Atsumbe1, B. N., Raymond, E.1., Enoch, E. B. & Patrick, D. (2012). Availability and utilization ofe-learning infrastructures in Federal University of Technology, Minna. *Journal of Education and Practice.3 (13),56-54.*

[8]. Kamba, A. M. (2009). Problems, challenges and benefits of implementing e-learning in Nigerian universities: An empirical study. *International Journal of Emerging Technologies in Learning(IJET).* 4 (1), 11 – 23.

[9]. Pirani, A. J. (2004). Supporting e-learning in higher education: road map, tools for navigating complex decisions. EDUCAUSE Centre for Applied Research.https:www.educause.edu/edcar

[10]. Nbina, J. B., Obomanu, B. J., & Vikoo, B. (2011). Utilization of Information and Communication Technology for quality instruction in Rivers State University of Education Port Harcourt: AnAssessment. *Journal of Emerging Trends in Educational Research and Policy Studies(JETERAPS).* 2 (1),74 – 80

