# MANAGEMENT OF E-LEARNING TECHNOLOGIES FOR EFFECTIVE INSTRUCTIONAL DELIVERY IN PUBLIC UNIVERSITIES IN RIVERS STATE, NIGERIA

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**Abstract**

This study examines the management of smartboards and projectors as e-learning technologies for effective instructional delivery in public universities in Rivers State. The increasing integration of these digital tools in higher education has revolutionized teaching and learning, yet their adoption and utilisation remain limited due to infrastructural deficiencies, lack of technical support, and inadequate training for lecturers. Two objectives, two research questions and two hypotheses were formulated to guide the study. Using a descriptive research design, data were collected from a sample of 344 lecturers across three public universities. Findings revealed that while smartboards and projectors enhance interactive learning and improve student engagement, challenges such as inconsistent power supply, limited availability of equipment, and lecturers' reluctance to transition from traditional methods hinder their optimal use. The study recommends increased investment in infrastructure, continuous professional development for lecturers, and strategic institutional policies to support the integration of smartboards and projectors in instructional delivery. Addressing these challenges will improve the quality of education and align university teaching with global digital learning standards.

**Keywords:** e-learning, Smartboard, Projector, Instruction, Management, University

## Introduction

Education is universally acknowledged as the foundation for meaningful societal development. It involves acquiring knowledge, skills, and moral values essential for fostering societal well-being and ensuring cultural preservation (Adiele et al., 2010). In Nigeria, formal education is classified into universal basic education, secondary education, and tertiary education, with universities serving as the highest institutions of learning (Federal Republic of Nigeria, 2013). Universities exist to provide quality education, conduct research, and engage in community service, all of which contribute to human capacity development (Amadi & Urho, 2015). The role of lecturers is central to these functions, as they are responsible for delivering instruction, conducting research, and fostering societal growth (Owo & Ajie, 2020). Effective university teaching necessitates competent lecturers who utilize innovative teaching methodologies and technology to enhance student learning outcomes.

The rapid advancement of technology has significantly influenced education, with e-learning emerging as a transformative force in university instruction. E-learning involves the use of information and communication technologies (ICTs) to facilitate teaching, learning, and research (Eteng & Ntui, 2009). This approach shifts from traditional teacher-centered methods to a more student-centered paradigm, where instructors act as facilitators. The benefits of e-learning include accessibility, flexibility, cost-effectiveness, and enhanced engagement (Bakare, Onah, & Okereke, 2018). It allows students to access learning materials remotely, participate in discussions, and collaborate with peers, making education more inclusive and adaptable to diverse learning needs. The integration of e-learning tools into higher education ensures that learning is continuous and unrestricted by time and space (Aluko, 2021).

Among the various e-learning technologies, smart boards and projectors play pivotal roles in enhancing instructional delivery. Smart boards, also known as interactive whiteboards, enable real-time interaction between students and lecturers through touch-sensitive displays (Gold, 2001). They allow for multimedia integration, interactive lessons, and digital annotations, making learning more engaging and dynamic. Projectors, on the other hand, facilitate large-scale visual presentations, making it easier for students to comprehend complex concepts (Okoro, 2008). These tools collectively contribute to a more effective learning environment by improving comprehension, retention, and collaboration among students (Pirani, 2004).

The application of smart boards and projectors in university education has revolutionized traditional teaching methods. Smart boards support multimedia content such as videos, animations, and interactive simulations, catering to various learning styles and preferences (Evarest & Laura, 2011). Projectors enhance classroom instruction by displaying high-quality images, charts, and presentations that aid in better understanding. In addition, these technologies promote active participation, allowing students to engage with course materials in real-time (Mishra & Koehler, 2020). Universities in developed nations have fully embraced these technologies, integrating them into lecture halls and laboratories to foster an interactive learning atmosphere. However, in developing countries like Nigeria, their adoption remains limited due to infrastructural constraints and lack of adequate training for lecturers (Ajayi, 2008).

Despite the benefits of smart boards and projectors, their availability and utilization in Nigerian universities are still inadequate. Many institutions lack the necessary infrastructure to support these technologies, leading to underutilization (Nwagbo & Ugwuanyi, 2011, cited in Agboeze, Ugwoke, & Onu, 2012). Additionally, some lecturers are not sufficiently trained to maximize the use of these tools in instructional delivery. Challenges such as inconsistent power supply, poor internet connectivity, and limited technical support further hinder the effective deployment of e-learning facilities (Olagboye, 2004, in Ololube, 2018). Addressing these challenges requires strategic investments in infrastructure, capacity building, and institutional support to ensure seamless integration and utilization of e-learning technologies in universities.

The management of e-learning technologies, including smart boards and projectors, is crucial for their optimal utilization. Effective management involves maintaining and updating these facilities to ensure their longevity and functionality (Asiabaka, 2008, in Ololube, 2018). Proper training for lecturers and technical support staff is essential to equip them with the skills needed to operate and troubleshoot these technologies. Moreover, universities must develop policies that encourage the consistent use of e-learning tools in teaching and assessment. By fostering a culture of technology-driven education, institutions can bridge the gap between traditional and modern learning methodologies, ultimately improving the quality of education (Akuchie, 2008; Kamba, 2009).

In conclusion, e-learning technologies such as smart boards and projectors have the potential to transform higher education by enhancing instructional delivery and student engagement. While developed countries have successfully integrated these tools into their education systems, Nigerian universities still face challenges in adoption and utilization (Organization of Economic Co-Operation and Development [OECD], 2005). To fully harness the benefits of e-learning, institutions must invest in infrastructure, provide adequate training for educators, and establish policies that support the seamless integration of technology into teaching and learning (Evarest & Laura, 2011). By addressing these challenges, universities in Nigeria can enhance the quality of education and equip students with the skills needed for the digital age.

**Statement of the Problem**

The increasing relevance of smartboards and projectors in higher education has transformed the landscape of teaching and learning. However, their effective use in public universities remains a significant challenge. The shift from traditional pedagogical approaches to constructivist methods, driven by advancements in digital technologies, has made it imperative for lecturers to adopt and effectively utilise smartboards and projectors in instructional delivery. Unfortunately, many lecturers lack the necessary skills to integrate these tools into their teaching practices.

Studies have shown that a large proportion of lecturers remain skeptical about the use of smartboards and projectors, often favoring conventional teaching methods. Meanwhile, students, though familiar with digital platforms, may not fully utilize these technologies for academic purposes. These challenges are further compounded by uncertainties surrounding the availability, maintenance, and efficient utilization of smartboards and projectors, raising concerns among educational stakeholders.

In public universities in Rivers State, the situation is worsened by infrastructural challenges such as unreliable electricity supply, outdated technological equipment, and insufficient technical support. As a result, the innovative use of smartboards and projectors for instructional delivery is neither widespread nor impactful, leading to suboptimal academic performance among students and a decline in the overall quality of education.

Given the critical role of smartboards and projectors in enhancing instructional delivery and meeting the demands of a globalized educational system, it is necessary to address these issues. This research, therefore, seeks to investigate the management of smartboards and projectors for effective instructional delivery in public universities in Rivers State.

**Objectives of the Study**

The study examined the management of e-learning technologies for effective Instructional delivery in public universities in Rivers state. It specifically sought to:

1. Investigate how smart board as e-learning technology is managed for effective instructional delivery in public universities in Rivers State.
2. Ascertain how projector as e-learning technology is managed for effective instructional delivery in public universities in Rivers State.

**Research Questions**

The following research questions were raised to guide the study:

1. How is smart board as e-learning technology managed for effective instructional delivery in public universities in Rivers State?

2. How is projector as e-learning technology managed for effective instructional delivery in public universities in Rivers State?

**Hypotheses**

The following hypotheses were postulated and statistically tested at 0.05 level of significance:

1. There is no significant difference between lecturers of federal and state universities in their mean rating on how smart board as e-learning technology is managed for effective instructional delivery in public universities in Rivers State.

2. There is no significant difference between lecturers of federal and state universities in their mean rating on how projector as e-learning technology is managed for effective instructional delivery in public universities in Rivers State.

**Methodology**

The study adopted descriptive research design. In other words, the responses to the research questions explained and described in the manner in which they appear without any form of manipulation. Through this design, the current and vital information about management of e-

learning technologies for effective instructional delivery would be described without manipulation.

The target population consist of 3448 academic staff in public universities in Rivers State (University of Port Harcourt, Rivers State University and Ignatius Ajuru University of Education). The study focused on understanding the management of e-learning technologies for effective instructional delivery across a representative sample of public universities in the state.

**Table 1: Population of Respondents in Each University in Rivers State**

| S/N | University | Population | Percentage |
|---|---|---|---|
| 1. | University of Port Harcourt | 1435 | 41.61% |
| 2. | Rivers State University | 1589 | 46.08% |
| 3. | Ignatius Ajuru University | 424 | 12.29% |
| | **Total** | **3448** | **100%** |

Source: Researcher's Field Study

The sample size for this study consists of 344 respondents which represents 10% of the population. The sample was selected using stratified random sampling technique and proportion sampling technique. Therefore, in applying these techniques, the stratified random sampling technique was used to split the population into the three public universities in Rivers State. Afterwards, the proportionate sampling technique was applied in calculating out the sample from each population unit of the universities to arrive at 344 respondents as shown below:

**Table 2: Population of Respondents in Each University in Rivers State with Proportionate sample**

| S/N | University | Population | Percentage | Proportionate sample |
|---|---|---|---|---|
| 1. | University of Port Harcourt | 1435 | 41.61% | 143 |
| 2. | Rivers State University | 1589 | 46.08% | 159 |
| 3. | Ignatius Ajuru University | 424 | 12.29% | 42 |
| | **Total** | **3448** | **100%** | **344** |

The instrument that was used for this study was self-structured questionnaire designed by the researcher titled "Management of E-Learning Technologies for Effective Instructional Delivery in Public Universities Questionnaire (MELTEIDIPUQ)" The instrument was divided into two sections: A and B. Section "A" elicited demographic data of the respondents, while section B

addressed the issues relating to the research questions. The instrument was structured based on a four point Likert rating scale weighted as follows: Strongly Agree (SA) = 4 Points, Agree (A) = 3 Points, Disagree (D), = 2 Points, Strongly Disagree (SD) = 1 point (See Appendix B).

The instrument for this study were subjected to face and construct validation by the researcher's three experts in the department of Educational Management, Ignatius Ajuru University of Education. Their corrections and comments were highly considered before the final instrument were drafted. Cronbach alpha was used to ascertain the reliability of the instrument. The researcher were administer twenty five copies of the instruments to twenty five lecturers who are not part of the study sample but part of the population. Two weeks later, another set of the same two instruments were re-administered to the same respondents and retrieved. The two scores obtained from these exercises were collated, computed and correlated using Pearson Product Moment Correlation Coefficient Formula (r) to determine the reliability index value.

344 copies of the questionnaire were distributed to lecturers in University of Port Harcourt, Rivers State University and Ignatius Ajuru University of Education with the help of two research assistants who are not related or known to the respondents, and it was collected by the agreed date. However, what was achieved after collection and collation was 329 which represented 95% retrieval rate.

The data collected from the field were analyzed using mean and standard deviation to answer the research questions, while the formulated hypotheses were tested using t-test statistics at 0.05 alpha level. In answering the research questions, an agreement threshold (cut-off mean) of 2.50 was used in taking decision on the research questions. This was derived from the 4-point Likert scale as follows: $(1 + 2 + 3 + 4) \div 4 = 2.50$; any mean value up to and above 2.50 were considered as high extent while any mean value below 2.50 were considered as low extent.

## Results

### Answer to Research Questions

**Research Question One:** How is smart board as e-learning technology managed for effective instructional delivery in public universities in Rivers State?

**Table 3: Mean ratings and standard deviation of the respondents on how smart board as e-learning technology is managed for effective instructional delivery in public universities in Rivers State.**

| | **How is smart board as e-learning technology managed for effective instructional delivery** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | **Federal = 137** | | **State = 192** | | | | |
| S/N | **Variables** | | | | | **Weighted Mean** | **Rank Order** | **Remark** |
| **1** | The university provides adequate training for instructors on the effective use of smart boards for instructional delivery. | 2.70 | 0.97 | 2.83 | 1.06 | 2.76 | 2nd | **Agreed** |
| **2** | Smart boards are regularly maintained to ensure consistent performance in classrooms. | 2.72 | 1.02 | 2.78 | 1 | 2.75 | 3rd | **Agreed** |
| **3** | There is sufficient technical support available to instructors for smart board issues during lectures. | 2.66 | 0.97 | 2.51 | 0.95 | 2.58 | 5th | **Agreed** |
| **4** | The university administration promotes the use of smart boards as an essential tool for e-learning. | 2.76 | 1.11 | 2.77 | 0.96 | 2.77 | 1st | **Agreed** |
| **5** | Smart board usage enhance student engagement and participation in the learning process. | 2.24 | 0.18 | 1.93 | 1.04 | 2.09 | 6th | **Disagreed** |
| **6** | The use of smart board ensures the effective recording of classes. | 2.79 | 1.12 | 2.71 | 0.9 | 2.75 | 3rd | **Agreed** |
| **Grand Weighted Mean** | | 2.65 | 1.06 | 2.59 | 0.98 | 2.62 | | **Agreed** |

Data on Table 3 show the mean ratings and standard deviation of the respondents on the how smart board as e-learning technology is managed for effective instructional delivery in public universities in Rivers State. The Table shows that both lecturers of federal and state universities agreed that university provides adequate training for instructors on the effective use of smart boards for instructional delivery, smart boards are regularly maintained to ensure consistent performance in classrooms, there is sufficient technical support available to instructors for troubleshooting smart board issues during lectures, university administration promotes the use of

smart boards as an essential tool for e-learning, the use of smart board ensures the effective recording of classes as seen on item 1, 2, 3, 4, 5 and 6 with weighted mean ratings of 2.76, 2.75, 2.58, 2.77, 2.09 and 2.75 respectively. From the ranking order, item 4 came 1st while item 5 came last, this indicates that majority of the respondents agreed that the university administration promotes the use of smart boards as an essential tool for e-learning. The grand weighted mean value of 2.62 shows that smart board as e-learning technology is managed for effective instructional delivery in public universities in Rivers State.

**Research Question Two:** How is projector as e-learning technology managed for effective instructional delivery in public universities in Rivers State.

**Table 2: Mean ratings and standard deviation on how projector as e-learning technology is managed for effective instructional delivery in public universities in Rivers State.**

| | **How projector as e-learning technology is managed for effective instructional delivery in public universities in Rivers State** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | **Federal = 137** | | **State = 192** | | | | |
| **S/N** | **Variables** | | | | | **Weighted Mean** | **Rank Order** | **Remark** |
| **7** | Projectors are installed in all lecture halls where they are needed to enhance instructional delivery. | 2.56 | 1.02 | 2.76 | 0.97 | 2.66 | 4th | **Agreed** |
| **8** | The management ensures a consistent supply of replacement components, such as bulbs, to minimize projector downtime. | 2.64 | 1.1 | 2.95 | 1.06 | 2.79 | 1st | **Agreed** |
| **9** | Projector use significantly improves student engagement and understanding of lecture content. | 2.7 | 1.07 | 2.5 | 0.99 | 2.60 | 6th | **Agreed** |
| **10** | The management of projector technology aligns well with the university's objectives for improving instructional quality. | 2.62 | 1 | 2.61 | 1.08 | 2.62 | 5th | **Agreed** |
| **11** | The management of projector promotes the effective visualization of lesson delivery. | 2.8 | 1.11 | 2.54 | 0.83 | 2.67 | 3rd | **Agreed** |
| **12** | The university provides sufficient training for instructors on the effective use of projectors for instructional delivery. | 2.74 | 0.88 | 2.73 | 1.04 | 2.74 | 2nd | **Agreed** |
| | **Grand Mean** | **2.68** | **1.03** | **2.68** | **1.06** | **2.68** | | **Agreed** |

Data on Table 2 show the mean ratings and standard deviation on the how projector as e-learning technology is managed for effective instructional delivery in public universities in Rivers State. The table shows that both lecturers of federal and state universities agreed that, projectors are installed in all lecture halls where they are needed to enhance instructional delivery, the management ensures a consistent supply of replacement components, such as bulbs, to minimize projector downtime, projector use significantly improves student engagement and understanding

of lecture content, the management of projector technology aligns well with the university's objectives for improving instructional quality, the management of projector promotes the effective visualization of lesson delivery, the university provides sufficient training for instructors on the effective use of projectors for instructional delivery as seen on item 7, 8, 9, 10,11 and 12 with the weighted mean ratings of 2.66, 2.79, 2.6, 2.62, 2.67 and 2.74 respectively. From the ranking order, item 8 came 1st with the weighted mean ratings of 2.79, while item 9 came last with the weighted mean ratings of 2.6 which indicates that the respondents agreed the management ensures a consistent supply of replacement components, such as bulbs, to minimize projector downtime. From the grand weighted mean value of 2.68, the answer to research question 2 is that projector as e-learning technology is managed for effective instructional delivery in public universities in Rivers State.

**Test of Hypotheses**

**Hypothesis One:** There is no significant difference between lecturers of federal and state universities in their mean rating on how smart board as e-learning technology is managed for effective instructional delivery in public universities in Rivers State.

**Table 6: Summary of t-test analysis of the significant difference between lecturers of federal and state universities in their mean rating on how smart board as e-learning technology is managed for effective instructional delivery in public universities in Rivers State.**

| Groups | N | | S.D | df | t | Sig. 2tailed | L. of Sig | Decision |
|---|---|---|---|---|---|---|---|---|
| Federal | 137 | 2.65 | 1.06 | 327 | .519 | 0.89 | 0.05 | **Accepted** |
| State | 192 | 2.59 | 0.98 | | | | | **Not Significant** |
| N= | 329 | | | | | | | |

***Level of significance = 0.05***

Data on Table 6 shows summary of significant difference between lecturers of federal and state universities in their mean rating on how smart board as e-learning technology is managed for effective instructional delivery in public universities in Rivers State.

The calculated t-value = .519, P-value = 0.89 at 0.05 level of significance, with 327 degrees of freedom. At 0.05 level of significance, the null hypothesis is therefore accepted. Based on the foregoing, the researcher accepted the null hypothesis, and confirmed that there is no significant difference between lecturers of federal and state universities in their mean rating on how smart board as e-learning technology is managed for effective instructional delivery in public universities in Rivers State.

**Hypothesis Two:** There is no significant difference between lecturers of federal and state universities in their mean rating on how projector as e-learning technology is managed for effective instructional delivery in public universities in Rivers State.

**Table 7: Summary of t-test analysis of significant difference between lecturers of federal and state universities in their mean rating on how projector as e-learning technology is managed for effective instructional delivery in public universities in Rivers State**

| N | N | | S.D | df | t | Sig. 2-tailed | L. of Sig | N |
|---|---|---|---|---|---|---|---|---|
| Federal | 137 | 2.68 | 1.03 | 327 | 2.899 | 0.091 | 0.05 | Accepted |
| State | 192 | 2.68 | 1.06 | | | | | Not Significant |
| N= | 329 | | | | | | | |

***Level of significance = 0.05***

From Table 7 above, the data depicts the summary of significant difference between lecturers of federal and state universities in their mean rating on how projector as e-learning technology is managed for effective instructional delivery in public universities in Rivers State. The calculated t-value = 2.874, P-value = 0.091 at 0.05 level of significance with degree of freedom of 327. At 0.05 level of significance, the null hypothesis is therefore accepted, hence there is no significant difference between lecturers of federal and state universities in their mean rating on how projector as e-learning technology is managed for effective instructional delivery in public universities in Rivers State.

**Discussion of Findings**

The findings presented in Table 3 highlight the respondents' perceptions on how smart boards, as a form of e-learning technology, are managed for effective instructional delivery in public universities in Rivers State. The data reveal a general agreement among lecturers from both federal and state universities on several key aspects of smart board management and use. Respondents agreed that universities provide adequate training for instructors on how to effectively use smart boards (Mean = 2.76). Additionally, there is a consensus that technical support is available for resolving issues during lectures (Mean = 2.58). These findings underscore the institutional efforts to build capacity and ensure smooth operation of smart boards during teaching sessions. The smart boards are perceived to be regularly maintained (Mean = 2.75), ensuring their consistent functionality. This suggests that the universities recognize the importance of sustaining technological infrastructure to enhance learning outcomes. Item 4, which had the highest mean score (Mean = 2.77), indicates that respondents strongly believe the university administration actively promotes the use of smart boards as essential e-learning tools. This administrative commitment is vital for integrating technology into the pedagogical framework and fostering innovation in teaching. Interestingly, item 5, which relates to the smart board's ability to effectively record classes, had the lowest mean score (Mean = 2.09). While this score still leans toward agreement, it reflects a relatively weaker perception of the smart board's role in this specific functionality. This may point to limitations in the available smart board models or insufficient training on utilizing this feature.

The findings of the study is in line with Suleiman et al. (2021), having found out that smart boards significantly improve the delivery of curricula, especially when digital content and multimedia resources are incorporated into lessons. In Rivers State universities, lecturers work closely with curriculum developers to create content that leverages the interactive features of smart boards. Consequently, the statement by Adedoyin & Soykan (2020) supported finding, having enumerated that the integration of multimedia elements such as videos, animations, and simulations enhances student comprehension and retention. Additionally, smart boards allow real-time feedback and assessments, making it easier to monitor student progress and adjust teaching methods accordingly.

In addition, the findings of the study is in line with Nwoke and Alabi (2019), that the availability of smart boards in classrooms is a critical factor for enhanced delivery of lecture. Public universities in Rivers State have worked on improving infrastructure to ensure that smart boards are accessible in a variety of lecture halls and seminar rooms. However, challenges related to the availability of electricity, internet connectivity, and suitable physical spaces for smart boards persist. Handling these challenges requires coordination between university management, local government, and other stakeholders as noted by Oloyede and Omole (2020). The use of smart boards allows lecturers to display multimedia content, annotate lessons, and interact with digital materials, making the learning experience more engaging.

The findings presented in Table 2 offer insights into how projectors, as a component of e-learning technology, are managed for effective instructional delivery in public universities in Rivers State. The analysis is based on the mean ratings and standard deviations of responses from lecturers in both federal and state universities. Item 7, with a mean rating of 2.66, indicates that respondents agree that projectors are installed in all necessary lecture halls to enhance instructional delivery. This suggests that institutions prioritize the availability of this technology in teaching spaces, which supports multimedia learning and helps modernize classroom instruction. Item 8 received the highest mean rating of 2.79, showing strong agreement that university management ensures a consistent supply of replacement components, such as bulbs, to minimize projector downtime. This proactive maintenance approach demonstrates institutional commitment to the uninterrupted use of projector technology in teaching. Lecturers also agreed that the use of projectors enhances student engagement and comprehension (Item 9, Mean = 2.60). Although this item had the lowest rating, it still reflects a positive perception. The slightly lower score may imply variability in how effectively instructors integrate projector use into their teaching or differences in student responsiveness. Item 10, with a mean of 2.62, indicates that the management of projector technology aligns well with the university's broader instructional quality goals. This highlights the deliberate integration of technology with institutional teaching and learning strategies. Respondents also agreed that projectors promote effective visualization of lesson content (Item 11, Mean = 2.67) and that sufficient training is provided to instructors for effective use (Item 12, Mean = 2.74). This shows that training and capacity-building initiatives are in place to support the pedagogical application of projectors.

The findings of the study is in line with Barkley (2010), in his opinion that the use of technology, particularly projectors, enhance classroom interactions by allowing students to engage in group presentations, demonstrations, and discussions. The multimedia capabilities of projectors

enable educators to integrate videos, animations, and live web content into their lectures, keeping students attentive and interested.

Also, the findings of the study agreed with Research by Hattie (2009) in their findings that when students are exposed to visual aids, such as images and videos, they develop a stronger understanding of complex concepts. For example, science classes can benefit from the use of projectors to display interactive diagrams or visual experiments, making abstract ideas more tangible.

## Conclusions

This study has established various professional development programmes for principals for effective administration of public senior secondary schools in Rivers State. Management of e-learning technologies is multifaceted. It encompasses planning, sourcing for resources, coordinating, directing, decision-making, controlling, communicating, and evaluating performance to ensure the effective use of human, financial, and material resources. Management should also continuously review and update e-learning policies to reflect emerging best practices and technological advancements. A proactive approach to policy development allows institutions to remain responsive to the evolving educational landscape and the needs of students and faculty. Through the study it was found out that the smart board as with any educational tool, can be effectively managed to enhance instructional delivery in public universities in Rivers State, addressing training, infrastructure, technical support, and policy considerations.

## Recommendations

Based on the findings of this study and conclusions drawn, the following recommendations were made:

1. The management of university education should provide adequate in-service training for lecturers on the utilization smart boards for effective instructional delivery.
2. Vice chancellors with their team of management should ensure the provisions of projectors in all lecture rooms which would effective visualization of lectures in the universities.
3. University administrators should establish a dedicated technical support team responsible for the regular maintenance and prompt troubleshooting of e-learning technologies such as smart boards and projectors to minimize downtime during lectures.

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