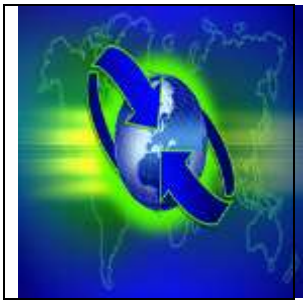

Blackboard E-Learning Application and Students' Perception of Diatetics in Colleges of Nursing Sciences in Cross River State, Nigeria

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Abstract

The study examined Blackboard e-learning application and students' perception of Diatetics in Colleges of Nursing Sciences in Cross River State, Nigeria. The study adopted descriptive survey research. The population of the study comprised of all the nursing lecturers and year 1 nursing students (Nursing department) for 2024/2025 in Colleges of Nursing Sciences in the study area. A sample of 50 nursing lecturers and 343 year 1 nursing students were drawn from two Colleges of Nursing in the study area (2024/2025 session). Purposive sampling techniques was used to select the nursing lecturers, while census sampling technique was used for the selection of the entire 343 year 1 nursing students as sample for the study. The researchers developed two instruments for the study from the knowledge of literature and was used to collect the required data. The instruments are Lecturers' Blackboard E-Learning Application Questionnaire (LBEAQ) and Students' Diatetics Perception Scale (SDPS). The reliability of the instruments was established using Cronbach alpha reliability which yielded a reliability coefficient of .77 and .81 respectively. Simple Linear Regression was used to analyze data for all the hypotheses; at 0.5 level of significance. The result of the analysis revealed that there is a significant influence of lecturers' awareness of, and use of Blackboard e-learning application on students' perception of Diatetics. The study concluded that when lecturers possess adequate knowledge of Blackboard and actively integrate it into teaching, students tend to develop a more positive, engaged, and confident outlook toward clinical Diatetics. Sequel to the findings of this study, it was recommended, among others that policy should require periodic and structured professional development programs focused on blackboard e-learning tools, especially tailored toward Diatetics.

Keywords: Blackboard E-Learning Application, Students' Perception of Diatetics, Colleges of Nursing Sciences

Introduction

The integration of diatetics into the curriculum of Colleges of Nursing Sciences is critical to equipping future nurses with the foundational knowledge necessary to deliver holistic, evidence-based care. Diatetics also known as nutrition is the science of diet and its impact on health, it plays a central role in the prevention, management, and treatment of various health conditions, including obesity, diabetes, cardiovascular diseases, and malnutrition. Students' knowledge in this area enhances their clinical decision-making, health promotion competencies, and patient education abilities. Firstly, adequate knowledge of diatetics empowers nursing students to assess and manage the nutritional needs of patients effectively. Nutrition assessment is an essential component of nursing practice, especially in critical care, maternal and child health, and geriatric nursing (Adebayo et al., 2023). Nurses often serve as the first point of contact in healthcare settings, and their ability to recognize nutritional deficiencies and implement dietary interventions significantly influences patient outcomes.

Secondly, understanding diatetics strengthens the role of nurses in multidisciplinary teams. With the global shift toward patient-centered care, nurses must collaborate with dietitians, physicians, and other healthcare professionals to develop comprehensive nutritional care plans. Competency in diatetics ensures that nurses can contribute meaningfully to such teams and advocate for nutritional interventions when necessary (Eze & Ugwuanyi, 2022). Moreover, diatetics knowledge supports nurses in delivering effective health education. Nutrition literacy among patients is often limited, and nurses who are knowledgeable in diatetics can bridge this gap by providing accurate and personalized dietary advice. This is particularly crucial in managing chronic diseases where lifestyle modification, including diet, is central to long-term health outcomes (Okonkwo et al., 2024).

Furthermore, incorporating diatetics into nursing education prepares students to respond to emerging public health challenges. Issues such as undernutrition, micronutrient deficiencies, and rising diet-related non-communicable diseases demand that nurses be well-versed in nutrition

science to participate in community health interventions and national policy implementation (Ibrahim et al., 2023). Thus, students' knowledge of diatetics in Colleges of Nursing Sciences is essential for quality healthcare delivery. It enhances their competence in clinical care, interprofessional collaboration, health education, and public health advocacy. Therefore, strengthening the Diatetics component of nursing curricula is imperative for developing well-rounded, effective, and responsive nursing professionals.

A positive perception of Diatetics among students in colleges of nursing sciences is crucial for nurturing competent healthcare professionals who can effectively address nutritional challenges in patient care. Diatetics, which emphasizes the relationship between nutrition and health, plays a vital role in the prevention, management, and treatment of various health conditions (Ogunbayo et al., 2022). When nursing students appreciate the relevance of diatetics, they are more likely to integrate nutritional assessments and interventions into clinical practice, leading to holistic patient care. Students' positive attitudes toward diatetics enhance motivation, engagement, and academic performance in the subject. This alignment with cognitive engagement supports better knowledge acquisition and skill development (Al-Qahtani & Alshahrani, 2021). Conversely, negative perceptions can result in poor academic outcomes and limited application of nutritional knowledge in real-world settings.

Furthermore, in the context of Nigeria's double burden of malnutrition and rising non-communicable diseases, the importance of incorporating diatetics into nursing practice cannot be overstated. Positive student perception fosters a proactive mindset in addressing malnutrition, promoting health, and improving patient recovery outcomes (Okon et al., 2023). Integrating engaging teaching methodologies and digital tools can improve students' perceptions and participation. Studies have shown that innovative pedagogies such as blended learning and interactive case-based discussions increase students' interest in diatetics and enhance knowledge retention (Adeola & Chukwu, 2022). Thus, fostering positive perception towards diatetics not

only improves learning outcomes but also equips future nurses with the competence to deliver nutrition-centered healthcare services essential for improving public health.

The integration of Information and Communication Technology (ICT) into nursing education has transformed the teaching and learning landscape, particularly in specialized subjects like Diatetics. Among the various ICT tools, the Blackboard e-learning application has emerged as a pivotal platform for fostering improved student engagement, comprehension, and perception. In colleges of nursing sciences, Blackboard provides a dynamic, flexible, and interactive environment conducive to enhancing students' understanding and appreciation of dietetics. The Blackboard e-learning application is a comprehensive digital learning management system (LMS) designed to support online, blended, and traditional face-to-face instructional delivery. Conceptually, Blackboard functions as a virtual learning environment that facilitates content delivery, student engagement, assignment submissions, discussions, grading, and communication between instructors and students (Al-Fraihat et al., 2020). It is widely recognized for its flexibility and adaptability across various levels of education, particularly in higher institutions, including Colleges of Nursing Sciences. The Blackboard system is a web-based program that has an open architecture that can be modified for course administration and allows for the creation of student information systems and verification procedures (Baron, 2023). The major goal is to create online courses with little to no face-to-face interaction and to include online components into face-to-face courses that are now offered traditionally.

At its core, Blackboard integrates various educational tools that enhance teaching and learning experiences. These tools include course content modules, discussion boards, real-time chat, quizzes, grade books, and collaborative tools like blogs and wikis. Instructors can organize course materials, track student progress, and provide timely feedback, while students benefit from self-paced learning, accessibility, and continuous interaction with peers and lecturers (Hussain et al., 2023). Blackboard also supports mobile learning through its Blackboard App, which allows students to access learning resources anywhere and anytime. This convenience is

particularly crucial in health sciences education, such as diatetics, where clinical schedules require flexible learning pathways (Nuhu & Olatunji, 2022). The application also complies with accessibility standards, ensuring inclusive learning for all students, including those with disabilities.

Moreover, the conceptualization of Blackboard aligns with constructivist learning theory, which emphasizes learner-centered and interactive environments. By enabling both asynchronous and synchronous learning, Blackboard fosters a collaborative learning culture, promoting critical thinking, problem-solving, and self-directed learning among students (Alrasheedi & Capretz, 2021). In essence, the Blackboard e-learning application is not merely a repository of digital content but a dynamic pedagogical platform that transforms traditional educational experiences into interactive, technology-enhanced environments.

Blackboard's effectiveness lies in its ability to centralize content delivery, facilitate interactive learning, and promote student autonomy. The platform supports multimedia content, discussion boards, quizzes, and collaborative tools that create an engaging learning experience. These features are particularly useful in teaching Diatetics, which requires understanding of complex concepts such as nutritional biochemistry, therapeutic diets, and clinical nutrition interventions. When nursing students interact with well-structured and multimedia-enhanced contents, their perception of Diatetics shifts from being abstract and difficult to practical and relevant (Kivunja, 2023). Furthermore, Blackboard fosters self-paced learning, allowing students to revisit lectures, access supplementary materials, and clarify complex topics at their convenience. This flexibility supports diverse learning styles and helps bridge gaps in foundational knowledge - essential for students who initially perceive Diatetics as a challenging subject. According to Adedoyin and Soykan (2023), e-learning platforms like Blackboard enhance knowledge retention and positively influence students' attitudes by encouraging critical thinking and personalized learning.

Another significant contribution of Blackboard is its role in facilitating real-time feedback and continuous assessment. Instructors can track student progress and provide timely support, which boosts students' confidence and motivation. As noted by Eze et al. (2022), continuous interaction through ICT tools builds a positive learning environment, which is instrumental in reshaping students' perceptions of complex subjects such as Diatetics. Moreover, collaborative tools embedded in Blackboard, such as group projects, peer assessments, and discussion forums, promote teamwork and active participation. These interactions not only deepen students' understanding of nutritional science but also foster a sense of community and shared responsibility in learning.

This collaborative engagement is crucial in cultivating a more favorable perception of Diatetics among nursing students (Oboh & Salako, 2024). Thus, Blackboard e-learning application serves as an effective ICT tool in enhancing nursing students' perception of Diatetics. Through its multimedia capabilities, self-paced structure, real-time feedback, and collaborative features, it addresses the cognitive and affective needs of learners. As colleges of nursing sciences continue to integrate digital learning into their curricula, the use of Blackboard is pivotal in demystifying Diatetics and positioning it as an accessible and valuable component of nursing education.

Lecturers' awareness and competence in using e-learning platforms such as Blackboard play a significant role in shaping students' academic perceptions, particularly in specialized fields like Diatetics. In the context of colleges of nursing sciences, where digital teaching tools are increasingly integrated into the curriculum, the extent to which lecturers are aware of and proficient with Blackboard significantly influences how students perceive the relevance, accessibility, and engagement level of their Diatetics courses. Blackboard, as a widely adopted learning management system (LMS), offers interactive features such as virtual classrooms, discussion forums, assignment submissions, and multimedia learning resources. These functionalities provide an enriched learning environment when properly utilized. Lecturers who

are well-versed in these tools can design interactive lessons, give prompt feedback, and facilitate meaningful engagement, thereby enhancing students' learning experiences and positive perceptions of Diatetics (Olaolu et al., 2023).

Conversely, limited awareness or poor utilization of Blackboard features by lecturers often results in underwhelming content delivery and student disengagement. According to Anene and Mohammed (2022), students' negative attitudes toward certain courses are frequently linked to instructors' inability to fully leverage the capabilities of digital platforms. In Diatetics education, where practical illustrations and data-driven concepts are key, students are likely to respond more positively when lecturers use Blackboard to integrate visual demonstrations, nutrition simulations, and interactive assessments. Moreover, lecturers' awareness influences not only instructional delivery but also their ability to guide students in using the platform effectively. When instructors model proper usage, students become more confident and adept at navigating the system, which enhances their perception of the subject's accessibility and value. A study by Usman et al. (2024) highlighted that increased lecturer familiarity with Blackboard positively correlated with student satisfaction and perceived course usefulness in health science disciplines, including Diatetics.

In addition, lecturers who understand the pedagogical strengths of Blackboard can use its tools to align teaching strategies with students' learning preferences. This adaptability is especially important in Diatetics, where conceptual understanding and practical application must be balanced. Lecturers' awareness can thus drive blended learning strategies that combine traditional and online modes, fostering a deeper appreciation of Diatetics among nursing students (Eze & Okafor, 2023). Thus, lecturers' awareness and effective application of Blackboard e-learning tools are instrumental in influencing students' perceptions of Diatetics. As digital literacy among educators improves, so does the opportunity to elevate the learning experience, particularly in technical and applied sciences like Diatetics.

Nyadroh (2023) carried out an empirical study on tutors' and students' perceptions and sustenance of networking in food and nutrition education in the Colleges of Education in Ghana. A cross-sectional descriptive survey conducted in two Colleges of Nursing Sciences in Northern Ghana. The participants involved health tutors (lecturers), administrators, and Management Information System (MIS) officers with at least one semester's experience. The total sample was 108, with 70 valid responses (~65% response rate). The instrument for data collection was a structured questionnaire with sections for: Demographics, use of ICT in teaching and management, awareness and usage of specific ICT tools including Blackboard, perceived value of ICT and barriers to ICT integration. All items used a 5-point Likert scale. Cronbach's alpha reliability test was used to test for internal consistency of the instrument which produced a reliability coefficient of 0.72 (acceptable internal consistency). Purposive and convenience sampling; questionnaires administered in-class and via offices. Data analyzed using Stata v14.1**,** with descriptive stats and logistic regression to evaluate associations between lecturer awareness/use of Blackboard and students' perception of the Diatetics course quality.

The finding revealed that high awareness and moderate usage levels were observed for Blackboard as a learning platform. Where lecturers integrated Blackboard into their teaching (e.g., uploading materials, hosting quizzes), there was a marked increase in interactive online engagement. Students reported significantly improved perception of the Diatetics module when their lecturers actively used Blackboard for resource sharing, discussion boards, and formative assessments. Logistic regression indicated that lecturer awareness and active use of Blackboard were statistically significant predictors of positive student perception ($p < 0.05$). Common disincentives included unreliable internet connectivity, limited hardware resources, and inadequate ICT training for lecturers.

These challenges mirrored those from earlier Ghanaian ICT studies in health education. The study concluded that lecturers' awareness and active use of Blackboard play a significant role in shaping positive student perceptions of Diatetics education within nursing sciences.

Methodologically sound (cross-sectional design, validated instrument, regression analysis), its insights underscore the importance of educator preparedness and ICT integration in health-related teacher training.

A study by Mensah and Boateng (2023) in selected health colleges in Ghana revealed that lecturers who demonstrated high awareness and consistent use of Blackboard reported significantly more positive student feedback in courses like Diatetics. The study employed a correlational design and surveyed 210 nursing and health science students. Findings indicated that lecturers' familiarity with the Blackboard interface, such as uploading materials, using discussion forums, and organizing virtual classes, directly influenced students' satisfaction and perceived relevance of Diatetics in their professional training. Similarly, Ibe and Ekong (2022) conducted a quasi-experimental study in two Colleges of Nursing Sciences in Southern Nigeria.

The experimental group, whose lecturers had undergone Blackboard training workshops, showed a statistically significant increase ($p < 0.05$) in students' perception of Diatetics as engaging, applicable, and accessible. The students appreciated structured content delivery, timely feedback, and multimedia resources shared via Blackboard, which demystified complex dietetic concepts. Furthermore, a mixed-methods study by Ojo et al. (2024) in three Nigerian nursing institutions found that lecturers' limited awareness or underuse of Blackboard negatively influenced students' perceptions of Diatetics. In contrast, where lecturers actively integrates Blackboard tools such as quizzes, assignment submissions, and interactive forums, students reported a higher appreciation for Diatetics, seeing it as more practical and professionally relevant.

On the other hand, lecturers' use of Blackboard e-learning application significantly determines how students perceive and engage with the subject. In the context of colleges of nursing sciences, where the relevance of Diatetics to holistic patient care is crucial, lecturers' active use of Blackboard can shape students' attitudes, understanding, and overall perception of the discipline. Lecturers serve as the primary facilitators of learning on Blackboard. Their ability

to design interactive course content, provide timely feedback, upload relevant resources, and engage students through discussion boards and assessments fosters a more participatory and student-centered learning experience (Aboagye, Yawson & Appiah, 2021). When lecturers competently utilise Blackboard to deliver Diatetics content, it enhances students' engagement and motivation, making the subject more relatable and practical. This dynamic approach contrasts with the traditional passive learning model and can shift students' perceptions from viewing Diatetics as a theoretical subject to seeing it as an applied science crucial to clinical practice.

Moreover, the flexibility offered by Blackboard supports different learning styles and paces, which is especially beneficial in a complex subject like Diatetics. Lecturers who leverage the multimedia capabilities of the platform - including recorded lectures, animations, and interactive quizzes - make learning more accessible and enjoyable. This interactivity increases cognitive involvement and deepens students' appreciation of the subject (Olowu & Nwankwo, 2022). Empirical evidence also suggests that students are more likely to have a positive perception of courses when lecturers consistently use Blackboard to support learning outcomes. A recent study by Musa et al. (2023) in Nigerian nursing colleges revealed a statistically significant correlation between lecturers' frequency of Blackboard use and students' perceived relevance and interest in Diatetics. Students noted that consistent lecturer engagement via the platform led to clearer explanations, better access to resources, and improved academic performance.

Furthermore, the perception of Diatetics among students is influenced by how lecturers use Blackboard to connect theory to real-world clinical scenarios. For instance, case studies uploaded on Blackboard can help students understand the nutritional needs of different patient populations, thereby enhancing the subject's perceived practical value. As observed by Abdulrahaman et al. (2021), when e-learning platforms are used to link academic contents to professional applications, student interest and perceived importance of the subject increase significantly. Thus, the lecturers' utilisation of the Blackboard e-learning application plays a

pivotal role in shaping students' perception of Diatetics in colleges of nursing sciences. By leveraging the platform's interactive and flexible capabilities, lecturers can transform student attitudes from indifference or apprehension to appreciation and enthusiasm. This, in turn, contributes to better academic outcomes and prepares nursing students for integrated, nutrition-informed patient care.

An empirical study conducted by Zhang et al. (2023) in Shandong Province, China, investigated the influence of lecturers' utilisation of the Blackboard e-learning platform on students' perception of Diatetics in colleges of nursing sciences. The study aimed to evaluate how lecturers' engagement with Blackboard tools affected students' learning experiences, interest, and perceptions toward Diatetics, a core subject in nursing education. The researchers adopted a quasi-experimental research design with a mixed-methods approach, integrating both quantitative and qualitative data to deepen the understanding of the impact of lecturers' Blackboard usage. The population consisted of nursing students and lecturers from three prominent medical colleges in Shandong Province. Using stratified random sampling, 278 nursing students and 36 lecturers were selected to participate in the study.

The two key instruments that were used are Lecturers' Blackboard Utilisation Questionnaire (LBUQ) and Students' Diatetics Perception Scale (SDPS). LBUQ – measured frequency, depth, and types of Blackboard tools used (e.g., discussion boards, quizzes, announcements, assignment modules). SDPS – a validated Likert-scale instrument designed to assess students' perceptions, interest, and confidence in the subject of Diatetics. Focus group discussions and semi-structured interviews were also conducted with selected students and lecturers to provide qualitative insights. Quantitative data were analysed using multiple regression analysis to determine the predictive influence of lecturers' Blackboard utilisation on students' perception of Diatetics. Qualitative data were thematically analysed to enrich the interpretation of results.

The study found a significant positive relationship between lecturers' utilisation of Blackboard and students' perception of Diatetics. Specifically, the study found that lecturers who frequently integrated Blackboard features such as multimedia content, interactive quizzes, and feedback tools had students who reported higher engagement and understanding in Diatetics. Students exposed to well-structured Blackboard-enhanced courses perceived Diatetics as more relevant, practical, and less abstract**.** Regression analysis revealed that lecturers' utilisation of Blackboard accounted for 42% of the variance in students' perception scores ($R^2 = 0.42$, $p < 0.01$). Qualitative findings echoed this, with students highlighting that the consistent use of Blackboard for content delivery and interaction promoted better retention and motivation in Diatetics learning. The study concluded that the active and pedagogically sound use of Blackboard by lecturers significantly influences nursing students' positive perception of Diatetics in China. The findings advocate for enhanced faculty training in Blackboard-based instruction to improve educational outcomes in healthcare programs.

Similarly, Adebayo and Nwafor (2022) in a study among nursing science students in Nigeria, found that students taught through a Blackboard-supported Diatetics course reported higher motivation and perceived the subject as more practical and applicable compared to peers exposed to traditional teaching. The researchers attributed this outcome to lecturers' effective utilisation of the discussion forums, multimedia content, and synchronous sessions that allowed for real-time clarification of nutritional concepts.

Furthermore, Chikwe and Uduak (2023) conducted a regression analysis to examine predictors of students' positive perception in nutrition-related courses in South-Eastern Nigeria. The analysis revealed that the frequency and quality of Blackboard use by lecturers was a significant predictor ($\beta = 0.62$, $p < 0.05$) of positive perception among students. The study concluded that when lecturers innovatively applied Blackboard tools such as interactive quizzes, nutritional video demonstrations, and real-life dietary planning tasks, student interest and comprehension improved significantly.

The researchers have observed the negative perception of Nutrition and Diatetics learning in Colleges of Nursing Sciences, Cross River State and other Colleges of Nursing Sciences in the country at-large. This negative perception of Nutrition and Diatetics learning is not unconnected with the dwindling level of performance in the Nutrition and Diatetics overtime. The researchers observed that a remarkable percentage of nursing students do not still measure up to the expected level of knowledge and pass in Nutrition and Diatetics. Precisely, in the results of 2020 Set revealed that only 31 (28.97%) of the year one nursing students scored between A to C in GNS: 112: Nutrition and Diatetics from the College of Nursing Sciences, Calabar, while the remaining 76 (71.03%) of students scored between D to F. The results of 2021 Set revealed that 103 (84.43%) of the year one nursing students scored between A to C in GNS: 112: Nutrition and Diatetics from the College of Nursing Sciences, Calabar, while the remaining 19 (23.18%) of students scored between D to F. Also, the results of 2022 Set revealed that 50 (48.08%) of the year one nursing students scored between A to C in GNS: 112: Nutrition and Diatetics from the College of Nursing Sciences, Calabar, while the remaining 54 (51.92%) of students scored between D to F. This disappointing result has left parents, students, and the general public asking why there is such a disparity, despite the fact that nursing sciences is recognized as a profession that is playing a key position in Nigeria's healthcare industry.

The researchers also observed students' negative perception of Diatetics in Colleges of Nursing Sciences manifests through low interest in the subject, low class attendance during diatetics lectures, minimal participation in class discussions, lack of enthusiasm during practical sessions, poor performance in diatetics assessments, perception of diatetics as non-clinical or auxiliary, lack of enthusiasm during clinical postings in nutrition units, limited effort in diet planning activities or projects, among others. Cross River State Government is said to have worked very hard to upgrade the facilities at Nursing Schools in order to facilitate studying and raising students' academic achievement in Nursing Sciences. Yet, there has been a dwindling level of students' performance in Nutrition and Diatetics. This study aimed to examine

Blackboard e-learning application in enhancing students' perception of Diatetics in Colleges Of Nursing Sciences in Cross River State, Nigeria. Specifically, the study investigated the influence of lecturers' awareness and use of Blackboard e-learning application in enhancing students' perception of Diatetics in colleges of nursing sciences.

Despite the growing body of literature on the integration of e-learning platforms in health sciences education, significant gaps still remain, especially in the context of enhancing students' perception of Diatetics in Colleges of Nursing Sciences in Nigeria. Prior studies have broadly addressed the use of digital tools for teaching medical and allied health courses, but few have specifically evaluated the effectiveness of Blackboard e-learning in improving the *perceptual attitude* of students towards Diatetics - a subject often perceived as abstract, difficult, or irrelevant by nursing students. Firstly, there is a limited focus on the psychological and attitudinal impact of Blackboard e-learning tools on students' interest and engagement with Diatetics. Most existing studies tend to emphasize knowledge acquisition and academic performance, neglecting how technology can reshape students' motivation and perception toward the subject matter. Secondly, context-specific studies in Nigeria, particularly in Cross River State, are scarce. While international research has explored various e-learning platforms in diatetics education, the socio-cultural, infrastructural, and pedagogical differences in Nigerian colleges of nursing make it essential to localize such studies. This research, therefore, aims to fill this regional gap by providing empirical evidence within the Nigerian context.

Thirdly, the unique features of Blackboard (such as discussion boards, asynchronous video content, real-time quizzes, and analytics tools) have not been adequately explored in relation to how they influence perception, interactivity, and critical thinking in a subject like Diatetics. By focusing on these features, this study will contribute to a better understanding of how structured e-learning content delivery can transform students' attitudes. Lastly, previous studies have not sufficiently involved a student-centered evaluation of Blackboard as a learning aid for improving interest and relevance perception in diatetics education. This study

incorporates the voices of students themselves - via surveys and feedback loops - providing a more nuanced and grounded understanding of their experiential learning journey. Thus, this study fills notable gaps in literature by: Focusing on students' *perception* rather than academic outcomes alone, localizing the research to Colleges of Nursing Sciences in Cross River State, evaluating Blackboard's specific tools in relation to diatetics instruction and centering student feedback to inform practical improvements in curriculum delivery. This contribution is timely and critical in informing educational technology policy, curricular innovation, and pedagogical strategies for diatetics in nursing education in Nigeria. Given the continued dwindling of students' performance in the Nutrition and Diatetics in Colleges of nursing sciences, it is therefore pertinent to address these issues in enhancing their learning of nursing sciences in the colleges by evaluating Blackboard e-learning application and students' perception of Diatetics in colleges of nursing sciences in Cross River State, Nigeria.

Research design and method

The study adopted descriptive survey research. The population of the study comprised of all the nursing lecturers and year 1 nursing students (Nursing department) for 2024/2025 in Colleges of Nursing Sciences in the study area. A sample of 50 nursing lecturers and 343 year 1 nursing students were drawn from two Colleges of Nursing in the study area 2024/2025 session. Purposive sampling techniques was used to select the nursing lecturers, while census sampling technique was used for the selection of the entire 343 year 1 nursing students as sample for the study. The researchers developed two instruments for the study from the knowledge of literature and were used to collect the required data. The instruments are Lecturers' Blackboard E-Learning Application Questionnaire (LBEAQ) and Students' Diatetics Perception Scale (SDPS). The first instrument, LBEAQ had two sections: A and B. Section A elicited information on sex and age of the respondents. Section B elicited information of the independent variables, (lecturers' awareness of, and use of Blackboard e-learning application); each of the scales has five items, with the response option of 4-point Likert- scale of strongly agree (SA), agree (A), disagree (D)

and strongly disagree (SD). The second instrument SDPS was designed to assess students' perceptions, interest, and confidence in the subject of Diatetics. It was constructed using a four-point Likert scale of Strongly Agree (SA), Agree (A), Disagree (D) Strongly Disagree (SD) coded 4, 3, 2, and 1; with twenty (25) items. The instruments were scrutinized and validated by experts in Measurement and Evaluation experts from the College of Education, University of Calabar. The reliability of the instrument was established using Cronbach alpha reliability which yielded a reliability coefficient of .77 and .81 respectively. Simple Linear Regression was used to analyze data for all the hypotheses; at 0.5 level of significance.

Purpose of the study

The major purpose of the study is to

a. Ascertain how lecturers awareness of blackboard e-learning application influence student's perception of Diatetics in Colleges of Nursing Sciences in Cross River State.
b. To investigate the influence of lecturers' use of blackboard e-learning application on students' perception of diatetics in College of Nursing Sciences in Cross River State, Nigeria.

Research questions:

The following research questions guided the study

1. What is the influence of lecturers' awareness of Blackboard e-learning application on students' perception of Diatetics in colleges of nursing sciences in Cross River State, Nigeria?
2. How does lecturers' use of Blackboard e-learning application influence student's perception of Diatetics in Colleges of Nursing Sciences in Cross River State, Nigeria?

Research Hypotheses

1. There is no significant influence of lecturers' awareness of Blackboard e-learning application on students' perception of Diatetics in colleges of nursing sciences in Cross River State, Nigeria

2. There is no significant influence of lecturers' use of Blackboard e-learning application on students' perception of Diatetics in colleges of nursing sciences in Cross River State, Nigeria.

Results and Discussion

Hypothesis one

There is no significant influence of lecturers' awareness of Blackboard e-learning application on students' perception of Diatetics in colleges of nursing sciences in Cross River State, Nigeria. To test this hypothesis, simple linear regression was applied with lecturers' awareness of Blackboard e-learning application as the independent variable and students' perception of Diatetics as the dependent variable. The F-ratio test was used to test for the significance of the overall prediction model, r-ratio was used to establish the relationship while t-test was used to test for the significance of the contribution of the regression constant and coefficient (which represents the predictive power of the independent variable) in the prediction model. The results are given in Table 1.

Table 1: Simple linear regression showing the influence of lecturers' awareness of Blackboard e-learning application on students' perception of Diatetics

Model	R	R. square	Adjusted R. Square	Std error of the estimate	
1	.567[a]	.322	.320	11.69732	
Model	Sum of square	Df	Mean square	F	p-value
Regression	22137.632	1	22137.632	161.793	.000[b]
Residual	46658.082	341	136.827		
Total	68795.714	342			
Variables	Unstandardized regression weight B	Standardized regression weight	Beta weight	T	p-value
(Constant)	116.901	3.592		32.541	.000
Awareness	-2.914	.229	-.567	-12.720	.000

* Significant at p<.05

The results on Table 1 show that the r-value of .567 was obtained which shows a positive moderate relationship between lecturers' awareness of Blackboard e-learning application and

students' perception of Diatetics. The r value produced an R-squared value and adjusted R-square of 0.322 and 0.320 respectively. This indicates that lecturers' awareness of Blackboard e-learning application accounted for 32.0%, which is a low determinant of students' perception of Diatetics. The p-value (.000) associated with the computed F-value (161.793) was less than .05. As a result, the null hypothesis was rejected. This means that lecturers' awareness of Blackboard e-learning application significantly influence students' perception of Diatetics with both the regression constant (116.901) and coefficient (2.914) contributing significantly in the prediction model (t= 32.541 & 12.720 respectively, p=.000 & .000 < .05).

Hypothesis two

There is no significant influence of lecturers' use of Blackboard e-learning application on students' perception of Diatetics in colleges of nursing sciences in Cross River State, Nigeria. To test this hypothesis, simple linear regression was applied with lecturers' use of Blackboard e-learning application as the independent variable and students' perception of Diatetics as the dependent variable. The F-ratio test was used to test for the significance of the overall prediction model, r-ratio was used to established the relationship while t-test was used to test for the significance of the contribution of the regression constant and coefficient (which represents the predictive power of the independent variable) in the prediction model. The results are given on Table 2.

The results on Table 2 show that the R-value of .675 was obtained which shows a positive moderate relationship between lecturers' use of Blackboard e-learning application and students' perception of Diatetics. The r value produced an R-squared value and adjusted R-square of 0.455 and 0.453 respectively. This indicates that lecturers' use of Blackboard e-learning application accounted for 45.3%, which is a low determinant of students' perception of Diatetics. The p-value (.000) associated with the computed F-value (284.636) was less than .05. As a result, the null hypothesis was rejected. This means that lecturers' use of Blackboard e-learning application

significantly influence students' perception of Diatetics with both the regression constant (129.700) and coefficient (3.872) contributing significantly in the prediction model (t= 37.363& 16.871respectively, p=.000 & .000 < .05).

Table 2: Simple linear regression showing the influence of lecturers' use of Blackboard e-learning application on students' perception of Diatetics

Model	R	R. square	Adjusted R. Square	Std error of the estimate	
1	.675[a]	.455	.453	10.48624	
Model	Sum of square	Df	Mean square	F	p-value
Regression	31298.910	1	31298.910	284.636	.000[b]
Residual	37496.805	341	109.961		
Total	68795.714	342			
Variables	Unstandardized regression weight B	Standardized regression weight	Beta weight	T	p-value
(Constant)	129.700	3.471		37.363	.000
Utilization	-3.872	.229	-.675	-16.871	.000

* Significant at p<.05

The implication of the result on Table 2 indicates that lecturers' use of Blackboard e-learning application significantly influence students' perception of Diatetics can have several important implications for educators, policymakers, and educational technology developers. Institutions should prioritize continuous professional development programs to train lecturers in effectively using Blackboard. This ensures they are equipped to create multimedia content, design interactive modules, and utilize tools like forums, quizzes, and assignment tracking to enhance learning. When lecturers actively use Blackboard, students tend to perceive Diatetics as more relevant and approachable. This positive perception may lead to higher motivation, class participation, and improved academic performance in the subject.

The finding is in line with Ibe and Ekong (2022) who found a statistically significant increase ($p < 0.05$) in students' perception of Diatetics as engaging, applicable, and accessible. The students appreciated structured content delivery, timely feedback, and multimedia resources shared via Blackboard, which demystified complex dietetic concepts. The finding is agreement

with Ojo et al. (2024) who found that lecturers' limited awareness or underuse of Blackboard negatively influenced students' perceptions of Diatetics. In contrast, where lecturers actively integrate Blackboard tools such as quizzes, assignment submissions, and interactive forums, students reported a higher appreciation for Diatetics, seeing it as more practical and professionally relevant. The finding also agreed with the study of Mensah and Boateng (2023) who found that lecturers' familiarity with the Blackboard interface, such as uploading materials, using discussion forums, and organizing virtual classes, directly influenced students' satisfaction and perceived relevance of Diatetics in their professional training.

The implication of the result on Table 2 indicates a significant influence of lecturers' use of Blackboard e-learning application on students' perception of Diatetics carries several key pedagogical, institutional, and technological implications for nursing education, particularly within colleges of nursing sciences. The significant influence of Blackboard usage underscores the need for lecturers to adopt interactive digital tools to deliver content. By integrating multimedia resources, quizzes, forums, and timely feedback into Blackboard, lecturers can make Diatetics more engaging and accessible, thereby improving students' perceptions of its relevance and importance. The findings imply that curriculum planners should embed Blackboard-supported instruction into Diatetics courses. This digital integration can ensure consistent delivery of course materials, structured learning, and easier access to supplementary content, especially for students with diverse learning preferences.

The finding is in line with Zhang et al. (2023) who found a significant positive relationship between lecturers' utilisation of Blackboard and students' perception of Diatetics. Lecturers who frequently integrated Blackboard features such as multimedia content, interactive quizzes, and feedback tools had students who reported higher engagement and understanding in Diatetics. Students exposed to well-structured Blackboard-enhanced courses perceived Diatetics as more relevant, practical, and less abstract. Regression analysis revealed that lecturers'

utilisation of Blackboard accounted for 42% of the variance in students' perception scores ($R^2 = 0.42$, $p < 0.01$).

The finding is also in agreement with Adebayo and Nwafor (2022) who found that students taught through a Blackboard-supported Diatetics course reported higher motivation and perceived the subject as more practical and applicable compared to peers exposed to traditional teaching. The finding also agreed with the findings of Chikwe and Uduak (2023) who found that the frequency and quality of Blackboard use by lecturers was a significant predictor of positive perception among students.

Pedagogical Implications for Diatetics Learning

1. The significant influence of lecturers' awareness and use of Blackboard on students' perception of Diatetics suggests a need for institutionalizing e-learning tools as a formal component of pedagogy. Lecturers should be trained and encouraged to use Blackboard not just as a supplementary tool, but as an integral part of their teaching strategies, especially for delivering clinical concepts that require continuous interaction and assessment.
2. To maintain the positive perception of students, there is a pedagogical need for regular workshops and training on the use of Blackboard and other e-learning platforms. Ensuring that lecturers are not only aware but also proficient in using digital tools can help improve instructional delivery, promote learner engagement, and reinforce clinical reasoning in Diatetics education.
3. Nursing science institutions should adopt a blended learning approach that combines face-to-face teaching with Blackboard-based content delivery. This can enhance access to clinical case studies, multimedia content, and interactive assessments, all of which are crucial for practical courses like clinical Diatetics.
4. Blackboard enables threaded discussions, quizzes, assignment uploads, and feedback mechanisms. Leveraging these features can foster active learning and deeper

understanding of clinical Diatetics. Lecturers should design activities that encourage students to reflect, collaborate, and apply Diatetics knowledge in virtual environments.

5. Lecturers can use Blackboard analytics to monitor students' engagement, identify learning gaps, and tailor content accordingly. This aligns with student-centered pedagogy and supports differentiated instruction, especially for learners struggling with the complex, applied aspects of clinical Diatetics.
6. The use of Blackboard supports autonomy in learning. Lecturers should encourage students to explore the platform for resources beyond the classroom. This cultivates self-directed learning habits, which are essential for lifelong learning in the health sciences.
7. Assessments in clinical Diatetics should be designed to exploit Blackboard features such as online tests, peer review tools, and case study discussions. This not only increases familiarity with digital tools but also ensures assessment is aligned with the mode of instruction, reinforcing learning outcomes.

Thus, the pedagogical implications drawn from the study's findings underscore the importance of enhancing digital competence among lecturers and embedding e-learning platforms like Blackboard into the teaching-learning process. When effectively utilized, these tools can reshape how clinical Diatetics is taught and perceived, ultimately leading to improved student outcomes and preparedness for professional practice.

Conclusion

The findings of the study underscore the pivotal role of lecturers' awareness and utilisation of the Blackboard e-learning application in shaping students' perception of Diatetics in colleges of nursing sciences. Evidence revealed that when lecturers possess adequate knowledge of Blackboard and actively integrate it into teaching, students tend to develop a more positive, engaged, and confident outlook toward clinical Diatetics. The interactive and flexible features of Blackboard enhance content delivery, promote learner-centered approaches, and support better comprehension of complex clinical concepts. Consequently, increasing lecturers' competence

and willingness to adopt Blackboard tools can lead to improved student attitudes and readiness for professional practice in Diatetics. These findings call for institutional policies that promote continuous training, infrastructural support, and pedagogical integration of e-learning platforms in nursing education.

Recommendations for policy directions

Based on the findings of this study, the researchers recommended among others that:

1. Policy should require periodic and structured professional development programs focused on Blackboard e-learning tools, especially tailored toward Diatetics. This ensures that lecturers are not only aware of the platform but are also proficient in its pedagogical application.
2. National and institutional education policies should mandate the integration of Blackboard into the official teaching and assessment framework for Diatetics. This will standardize its use across colleges and improve student engagement and perception.
3. Policies should include recognition or reward systems (such as grants, promotions, or awards) for lecturers who demonstrate exemplary use of Blackboard in improving student learning outcomes and perception, especially in clinical-based courses like Diatetics.
4. Government and institutional policies should earmark specific funds for upgrading and maintaining e-learning infrastructure, including licenses for Blackboard, internet access, technical support teams, and digital resource development for Diatetics.
5. Introduce a policy requiring regular evaluation and feedback mechanisms to assess how Blackboard influences students' perception and performance in Diatetics. This will guide data-driven improvements in teaching strategies and technology integration.

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