PERCEIVED IMPACT OF TRADITIONAL AND ONLINE LEARNING PLATFORMS ON NURSING STUDENT'S KNOWLEDGE AND CRITICAL THINKING IN A TERTIARY INSTITUTION IN BENIN CITY

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OCTOBER, 2025

DECLARATION

This is to declare that this research "Perceived Impact Of Traditional And Online Learning Platforms On Nursing Student's Knowledge And Critical Thinking In A Tertiary Institution In Benin City" was carried out by Otobore Success Oghenerukevwe. It is solely the result of my work except were acknowledged as being derived from other person (s) or resources.

EXAMINATION NUMBER: _____

FACULTY/SCHOOL: FACULTY OF NURSING SCIENCE, , UNIVERSITY OF BENIN, BENIN CITY

Signature: …….

Date: …….

CERTIFICATION/APPROVAL

This is to certify that this project "Perceived Impact Of Traditional And Online Learning Platforms On Nursing Student's Knowledge And Critical Thinking In A Tertiary Institution In Benin City" was carried out by Otobore Success Oghenerukevwe with Mat. No. BMS1902356 in the Department of Nursing Sciences under the supervision of Prof. (Mrs.) R. E. Esewe

Prof. (Mrs.) R. E. Esewe _____

Supervisor**.** Sign & date

Prof. (Mrs) C.E Omoregbe _____

Head of Department Sign & date

External Examiner _____

Sign & date

DEDICATION

This study is dedicated to God Almighty for his grace and protection through the period of this research and also to my beloved parents Mr and Mrs Otobore for their love and support

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ABSTRACT

Learning platforms play a vital role in shaping students' academic achievement and critical thinking skills, particularly in highly demanding fields like nursing. Understanding how traditional and online learning platforms impact these competencies is essential for improving nursing education. This study assessed the perceived impact of traditional and online learning platforms on nursing students' knowledge acquisition and critical thinking skills at the University of Benin. A descriptive cross-sectional survey design was adopted, utilizing a convenience sampling technique to select 245 nursing students across different academic levels. Data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 27.0, focusing on sociodemographic characteristics, perceived impacts, and platform-specific strengths and limitations. The study revealed a predominantly young and female student population, with 47.9% of respondents aged 21–25 years and females accounting for 88% of the participants. Traditional learning platforms were perceived by 75% of respondents as having a high positive impact, enhancing understanding of concepts (mean = 3.5), promoting active participation (mean = 3.2), and supporting critical thinking through real-time feedback. Similarly, 78% of students reported a high positive impact from online learning platforms, citing flexibility, ease of access to diverse resources (mean = 3.1), and the ability to revisit recorded lectures (mean = 3.3) as major benefits. However, challenges such as poor internet connectivity (50% strongly agreed) and the need for higher self-discipline were noted. Both traditional and online platforms contribute significantly to students' cognitive development, highlighting the importance of a blended learning approach. Educational institutions should enhance internet infrastructure, promote structured online learning strategies, and integrate critical thinking exercises across both platforms. Further research is recommended to explore the long-term academic and professional outcomes associated with blended learning environments.

Keywords: *Perception, Traditional Learning, Online Learning, Knowledge Acquisition, Critical Thinking.*

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CHAPTER ONE

INTRODUCTION

1.1 Background of study

In the ever-evolving landscape of education, the distinction between traditional and online learning platforms has become increasingly relevant, particularly in professional disciplines such as nursing (Deniz & Alıcı, 2024). The emergence of digital technologies, further accelerated by the COVID19 pandemic, has led to a global shift toward online education, prompting educational institutions to reassess the effectiveness of their pedagogical approaches (Webb et al., 2021). This shift raises pertinent questions regarding the comparative impact of traditional and online learning platforms on students' knowledge acquisition and critical thinking skills, particularly in fields requiring both cognitive and hands-on competencies like nursing (Enoch et al., 2022). Traditional classroom learning, often characterized by face-to-face lectures, hands-on demonstrations, and structured assessments, has long been considered the gold standard in nursing education (Makarova, 2021). This model is deeply rooted in the behavioral and cognitive theories of learning, where interaction, mentorship, and immediate feedback are seen as essential to developing both theoretical knowledge and clinical reasoning.

Learning tools such as projectors, anatomical models, and lab-based simulations have supported active engagement in traditional settings, fostering not only knowledge retention but also professional values and collaborative skills (El Sadik & Al Abdulmonem, 2021). However, with the increasing integration of educational technologies, online learning has emerged as a credible alternative. E-learning platforms, flipped classrooms, problem-based learning (PBL), and immerse virtual simulations are transforming how nursing students engage with course content

(Rossi et al., 2021). These approaches emphasize self-directed learning, flexibility, and accessibility, allowing students to control their pace and style of learning. Importantly, numerous studies highlight that such models can improve cognitive engagement and critical thinking when properly implemented (Razak et al., 2022). Critical thinking is a cornerstone of nursing education, directly influencing clinical decision-making, patient safety, and quality of care. Several pedagogical innovations have been developed to enhance this skill set. For example, the flipped classroom model, where students review content at home and engage in problem-solving during class, has been shown to shift learners from passive recipients to active participants (Yulian, 2021). Similarly, the Socratic method and collaborative learning frameworks—both of which are adaptable to online and traditional environments—have demonstrated efficacy in nurturing analytical reasoning and reflective judgment among healthcare students (Ho et al., 2023). Nonetheless, the effectiveness of these learning modalities may vary across learner demographics, technological access, instructional design, and cultural contexts (Kormos et al.,2023). For instance, while some studies affirm the advantages of online platforms in improving student engagement and critical thinking (Meirbekov, et al.,2022), others report significant challenges such as limited interaction, digital fatigue, and reduced practical exposure (Hazaymeh, 2021). These discrepancies underline the need for a nuanced understanding of how different teaching modalities affect nursing students' educational outcomes, particularly their knowledge depth and critical thinking capacity.

Moreover, research highlights that the adoption of online learning requires a high level of digital literacy, self-motivation, and infrastructural support, all of which can influence learner satisfaction and academic performance (Rajabalee et al., 2022). On the other hand, traditional learning, while generally more structured, may not sufficiently cater to the diverse learning

preferences of Nigerian students or fully leverage technological advancements that enhance experiential learning (Ayanwale et al., 2024). Given these dynamics, the interplay between instructional mode and learner outcome warrants rigorous investigation, especially in critical disciplines such as nursing.

In addition, the COVID-19 pandemic acted as a catalyst for widespread digital transformation in education. Institutions rapidly transitioned to online platforms, revealing both the potential and the limitations of remote learning. During this time, several studies documented a paradigm shift in learners' perceptions, with some students adapting positively to online models, while others expressed concern about reduced engagement and inadequate clinical exposure (Langegård et al., 2021). These insights underscore the importance of exploring the perceived effectiveness of these platforms not only from a pedagogical standpoint but also from the learners' subjective experiences.

1.2 statement of problem

Each year, millions of nursing students are faced with a challenging educational landscape, which has been significantly affected by the rapid adoption of online learning platforms, particularly during the COVID-19 pandemic (Langegard et al., 2021). While these platforms were initially developed to support educational continuity during emergencies, their impact on knowledge acquisition and critical thinking skills among nursing students has become a subject of growing concern (Hazaymeh, 2021). Studies have indicated that despite the flexibility and accessibility provided by online learning, many nursing students face difficulties that hinder their ability to engage fully with the course material, such as technological challenges, reduced interaction with instructors, and feelings of isolation (Foo, 2021).

The effects of a hastily implemented online learning model can lead to negative outcomes; nursing students often experience decreased motivation, anxiety, and dissatisfaction with their learning experiences (Rajabalee & Santally, 2021). Such stressors can adversely influence their academic performance and the development of essential clinical skills, critical for their future careers (Alzahrani, 2022). Interpersonal relationships with instructors and peers, vital components of nursing education that foster collaborative learning and critical thinking development, have been reported to suffer under current online learning paradigms (El Sadik, 2021). The inadequate adaptation of nursing education to a fully online model raises concerns about its effectiveness in preparing students for the complexities of patient care (Meirbekov,2022).

Various adaptive strategies have been explored to enhance the efficacy of online nursing education; however, substantial gaps in research persist regarding the best practices for effectively integrating online platforms into nursing curricula (Molato & Sehularo, 2022). The current modalities often lack proper evaluation of their impact on crucial areas such as students' knowledge, critical thinking skills, and overall academic satisfaction (Rivaset al., 2022). Although various interactive technologies are touted as beneficial for enhancing online learning, their actual application and impact are frequently under-evaluated (Razak et al., 2022). Preliminary findings suggest that integrating blended learning strategies, which combine online education with traditional face-to-face interactions, might hold promise for improving student outcomes in nursing education amidst the challenges faced during the pandemic (Zalat et al., 2021).

1.3 Aim of the Study

The aim of this study is to assess the perceived impact of traditional and online learning platforms on nursing students' knowledge and critical thinking in a tertiary institution in Benin City, Edo stare.

1.4 Objectives of the Study

The objective of this study is:

1. To assess nursing students' perception of traditional classroom learning in enhancing their knowledge and critical thinking in a tertiary institution in Benin city
2. To determine nursing students' perceptions of online learning platforms in knowledge acquisition and critical thinking development in a tertiary institution in Benin city
3. To identify the strengths and limitations of both traditional and online learning platforms as perceived by nursing students in a tertiary institution in Benin city

1.5 Research question

1. What are nursing students' perceptions of traditional classroom learning in relation to enhancing their knowledge and critical thinking skills in a tertiary institution in Benin City?
2. How do nursing students in a tertiary institution in Benin City perceive online learning platforms in terms of knowledge acquisition and critical thinking development?
3. What are the strengths and limitations of both traditional and online learning platforms as perceived by nursing students in a tertiary institution in Benin City**?**

1.6 Research hypotheses

Ho: There is no significant relationship between nursing students' perceptions of traditional classroom learning and online learning platforms on students and their academic level.

H_1: There is a significant relationship between nursing students' perceptions of traditional classroom learning and online learning platforms on students and their academic level.

1.7 significance of study

1. To the Nursing Profession:

This study is of critical importance to the nursing profession as it explores the perceived impact of traditional and online learning platforms on the development of core competencies such as knowledge acquisition and critical thinking—both essential for effective nursing practice. Understanding how different educational modalities affect learning outcomes will provide valuable insights for nurse educators and academic institutions in refining curricula, improving teaching strategies, and fostering more engaging learning environments. This, in turn, will ensure that nursing graduates are not only well-versed in theoretical knowledge but also equipped with the critical thinking skills necessary to make sound clinical decisions in diverse and evolving healthcare settings.

2. To Healthcare:

Given that nurses constitute the largest proportion of healthcare providers globally, the quality of their education directly influences the overall efficacy of healthcare delivery. By examining the impact of educational platforms on nursing students' preparedness, this study contributes to improving the standard of patient care. Ensuring that nurses are well-trained in both knowledge and analytical reasoning reduces the likelihood of clinical errors, enhances interdisciplinary

collaboration, and promotes evidence-based practice. The findings of this study can inform healthcare institutions and policymakers on the importance of supporting effective educational models that enhance workforce readiness and patient outcomes.

3. To Society**:**

A well-educated nursing workforce has far-reaching benefits for society at large. Nurses play a pivotal role in promoting public health, managing chronic diseases, and responding to emergencies, all of which require a high level of competence and critical thinking. By evaluating the effectiveness of learning platforms in developing these competencies, this study supports the broader goal of creating resilient, knowledgeable, and adaptive healthcare professionals. The societal benefit lies in improved healthcare accessibility, safety, and trust, ultimately contributing to healthier communities and a stronger public health infrastructure.

1.8 scope of study

This study is focuses on examining the perceived impact of traditional and online learning platforms on nursing students' knowledge acquisition and critical thinking skills within a tertiary institution.

1.9 Operational definition of terms

1. Platform refers to the structured environment or system used for delivering educational content and facilitating learning
2. Traditional Learning Platforms**:** In this study, traditional learning platforms refer to in person, classroom-based instructional methods where teaching and learning occur through face-to-face interactions between instructors and nursing students within a formal academic setting.

3. Online Learning Platforms: Online learning platforms refer to digital or internet-based systems used for delivering instructional content remotely. These include virtual classrooms, learning management systems (LMS), video conferencing tools (e.g., Zoom, Google Meet), and other e-learning technologies utilized in nursing education.
4. Knowledge Acquisition: This term refers to the process by which nursing students receive, understand, retain, and recall academic and clinical information delivered through either traditional or online learning platforms.
5. Critical Thinking Skills**:** In the context of this study, critical thinking skills are defined as the cognitive abilities nursing students use to analyze, evaluate, and apply knowledge in clinical reasoning and decision-making. These skills are crucial for effective patient care and professional nursing practice.
6. Impact: Impact refers to the measurable effects or outcomes that traditional and online learning platforms have on nursing students' knowledge acquisition and critical thinking skills. This includes academic performance, ability to apply learned concepts, and clinical competence.
7. Perception: Perception denotes the subjective views, attitudes, or beliefs held by nursing students regarding the effectiveness, usability, and overall experience of traditional and online learning platforms in enhancing their learning and critical thinking.

CHAPTER TWO

LITERATURE REVIEW

This chapter focuses on the review of related literature under the following headings; conceptual review, theoretical review and empirical review. Necessary literature would be gotten from published and unpublished works, articles and journals in this study.

2.1 Conceptual review

2.1.1 Concept of Learning

Learning is a continuous process through which individuals acquire new knowledge, skills, attitudes, and behaviors that lead to a change in understanding or performance (Hadiyanto et al., 2021). It is not limited to formal education but occurs throughout life as people interact with their environment, experiences, and others. In nursing education, learning plays a central role in developing competent professionals who can apply theoretical knowledge to real-life clinical situations (Bayram et al., 2022). Learning can be defined as a relatively permanent change in behavior or capability resulting from experience and practice. It involves the active engagement of the learner in acquiring, processing, and applying information (Challa

et al., 2021). According to educational theorists such as Piaget and Vygotsky, learning is both a cognitive and social process. Piaget emphasized the role of cognitive development in learning,

while Vygotsky highlighted the importance of social interaction and cultural context (Issa & Khataibeh, 2021).

In the nursing context, learning extends beyond memorization to include critical thinking, problem-solving, and decision-making. Nursing students must integrate theoretical concepts with practical experience to provide safe and effective care (Kantek & Yıldırım, 2020). Traditional classroom learning provides structured, face-to-face interaction where teachers guide and assess students' understanding, while online learning offers flexibility, self-directed study, and access to diverse resources (Ali et al., 2022; Almendingen et al., 2021). Both modes of learning aim to enhance students' cognitive, psychomotor, and affective domains of learning (Fatima et al., 2022). Ultimately, effective learning in nursing depends on active participation, reflection, and the ability to apply acquired knowledge in clinical practice (Rossi et al., 2021). It requires a supportive environment that encourages inquiry, collaboration, and continuous improvement, enabling nursing students to develop the competence and confidence needed for professional practice (Jones et al., 2024; Evgın & Sümen, 2023).

2.1.2 Overview of Learning Platforms in Nursing Education

In contemporary educational settings, particularly within the realm of nursing education, learning platforms play a pivotal role in shaping the pedagogical experiences of students. These platforms, whether traditional or technologically mediated, serve as structured environments where instructional content is delivered, skills are developed, and cognitive processes such as critical thinking are nurtured. The evolution of learning platforms has been largely influenced by advances in educational technologies, the increasing need for flexible learning arrangements, and

global disruptions such as the COVID-19 pandemic, which necessitated a rapid shift from conventional classroom settings to online modalities (Bdair, 2021).

Traditional learning platforms in nursing education are typically characterized by face-to-face classroom instruction, clinical placements, practical demonstrations, and direct interpersonal interactions with instructors and peers. These platforms emphasize experiential learning through observation, simulation, and hands-on practice, which are crucial for developing essential nursing competencies. They allow for immediate feedback, emotional engagement, and the development of communication and teamwork skills, all of which are foundational to the nursing profession (Gherheș et al., 2021). However, traditional platforms may also face limitations, such as inflexible schedules, resource constraints, and geographical inaccessibility, especially for students in remote or underserved areas (Makarova, 2021). On the other hand, online learning platforms have emerged as transformative tools in nursing education, offering flexibility, self-paced learning, and accessibility to a wider range of educational resources. These platforms typically include Learning Management Systems (LMS), video conferencing tools, discussion forums, virtual simulations, and multimedia content delivery. Online learning facilitates asynchronous and synchronous modes of instruction, thereby accommodating diverse learning preferences and schedules (Ouadoud et al., 2021). In addition, the integration of artificial intelligence, interactive modules, and virtual reality technologies has enhanced the potential for student-centered learning, simulation-based skill development, and continuous assessment (Firdaus et al., 2022).

Despite these advancements, the adoption of online platforms in nursing education is not without challenges. Several studies have highlighted issues such as technological barriers, reduced

opportunities for hands-on skill acquisition, feelings of isolation, and diminished student engagement (Hazaymeh, 2021). For nursing students, the lack of physical interaction in online learning can hinder the development of clinical reasoning and affective skills that are typically nurtured through real-world practice and mentoring (Peimani & Kamalipour, 2021). Additionally, the sudden shift to online learning during the pandemic led to disparities in learning outcomes, with many students and faculty reporting dissatisfaction due to unpreparedness and insufficient training in digital pedagogy (Selvaraj et al., 2021).

To bridge the gap between traditional and online education, many institutions have adopted blended learning platforms, which combine the strengths of both methods. Blended learning allows students to benefit from the flexibility and resource richness of online education while still engaging in essential in-person activities such as laboratory work, simulations, and clinical placements (El Sadik & Al Abdulmonem, 2021). This approach has been shown to improve learning outcomes, promote higher levels of engagement, and foster critical thinking by allowing students to reflect on theoretical knowledge in practical contexts (Rossi et al., 2021; Dong et al., 2021).

In essence, learning platforms in nursing education are not static entities but dynamic systems that must continuously evolve to meet the educational needs of students and the professional demands of the healthcare environment. Whether traditional, online, or blended, the effectiveness of these platforms depends on thoughtful instructional design, accessibility, interactivity, and the capacity to cultivate both cognitive and practical skills. As nursing education continues to integrate digital tools and pedagogical innovations, understanding the perceptions of students

towards these platforms becomes crucial in ensuring that educational delivery remains effective, inclusive, and aligned with the goals of nursing practice.

2.1.2 Concept of Learning Platforms in Nursing Education

Learning platforms are integral to the structure and delivery of education in modern academic contexts, particularly in professional fields such as nursing. In nursing education, these platforms serve as the foundational frameworks through which students engage with theoretical knowledge, develop practical skills, and cultivate essential competencies such as critical thinking, clinical reasoning, and decision-making. The term "learning platform" encompasses a variety of educational environments, tools, and methods—ranging from traditional classroom settings to technologically advanced online systems and hybrid models that merge both modalities. Each platform plays a significant role in shaping how students access information, interact with content, and apply learned concepts to real-world healthcare scenarios. Traditionally, nursing education has been rooted in face-to-face instruction within classroom and clinical settings. These conventional platforms prioritize direct interaction between students and instructors, hands-on demonstrations, simulations in physical laboratories, and in-person clinical placements in healthcare facilities. Such learning experiences are invaluable in promoting the development of psychomotor skills, interpersonal communication, and professional behavior. Furthermore, traditional learning fosters a sense of discipline and structure, often viewed as essential in healthcare professions where real-time decision-making and team collaboration are critical (Gherheș et al., 2021).

However, traditional platforms are not without limitations. Access to physical resources, inflexible schedules, large class sizes, and geographic constraints can hinder students' learning

experiences and limit the reach of educational institutions. These challenges became more evident during the COVID-19 pandemic, when the global shift to remote education revealed the vulnerabilities of relying solely on face-to-face instruction (Foo et al., 2021).

In response, there has been a significant expansion in the use of digital learning platforms across nursing programs. Online learning platforms represent a shift towards greater accessibility, interactivity, and learner autonomy. They include web-based Learning Management Systems (LMS) such as Moodle, Blackboard, or Canvas, as well as synchronous tools like Zoom or Microsoft Teams that facilitate live lectures, discussions, and virtual office hours. Through these platforms, students can access learning materials, submit assignments, receive feedback, and participate in virtual simulations or group activities. The flexibility of online learning allows students to study at their own pace and accommodate personal schedules, making nursing education more inclusive for non-traditional students, working professionals, or those in remote locations (Ouadoud et al., 2021).

The integration of innovative technologies such as immersive virtual reality (VR), artificial intelligence (AI), and gamification has further expanded the capabilities of online platforms.

These technologies enable realistic clinical simulations, adaptive learning pathways, and personalized feedback mechanisms, thereby enhancing both knowledge acquisition and skills development (Firdaus et al., 2022). For instance, virtual patient simulators allow nursing students to practice diagnostic reasoning, therapeutic communication, and emergency response in a controlled, risk-free environment. Despite these benefits, online learning platforms also present notable challenges. Many students and instructors face issues such as limited digital literacy, inadequate internet connectivity, lack of motivation, and decreased engagement in online

environments (Hazaymeh, 2021). Furthermore, the absence of physical presence and tactile interaction can negatively affect the acquisition of psychomotor skills and the development of empathetic patient care both crucial aspects of nursing practice. Concerns regarding academic integrity, reduced student accountability, and difficulties in fostering collaborative learning have also been cited as drawbacks (Alzahrani, 2022).

In an effort to leverage the strengths and mitigate the weaknesses of both traditional and online learning, many nursing institutions have adopted blended learning or hybrid models. Blended learning combines face-to-face instruction with online components, allowing students to benefit from the flexibility of digital platforms while still participating in essential in-person activities such as clinical simulations and practical assessments (Dong et al., 2021). This approach has been shown to enhance student engagement, promote deeper learning, and improve critical thinking by encouraging students to apply theoretical knowledge in real-time clinical settings (Rossi et al., 2021).

As nursing education continues to evolve, the concept of learning platforms must be understood as a dynamic and adaptive construct. Effective learning platforms are those that are learner centered, accessible, pedagogically sound, and technologically responsive. They must not only convey information but also foster interaction, reflection, and critical inquiry skills that are indispensable for future nurses working in complex and ever-changing healthcare environments. Understanding the impact of these platforms on nursing students' academic performance, critical thinking development, and overall satisfaction is essential for guiding future educational policies and practices

2.1.3 Traditional Learning in Nursing Education

Traditional learning, often referred to as face-to-face or classroom-based instruction, has long been the cornerstone of nursing education (Atan, et.al. 2024). It encompasses structured, instructor-led teaching methods that occur in physical settings such as classrooms, laboratories, and clinical environments. In this approach, learning is primarily facilitated through lectures, demonstrations, group discussions, hands-on practice, and real-time interactions between students and educators. The traditional model is deeply embedded in the history of nursing education and remains a widely used and respected method for preparing students for the demands of clinical practice (Bam et.al., 2021)

One of the core strengths of traditional learning lies in its capacity to provide direct, immediate feedback and guidance from instructors. In a classroom setting, educators can adapt their teaching strategies in response to students' non-verbal cues, questions, or confusion, thereby fostering a responsive and dynamic learning environment. Additionally, face-to-face instruction allows for meaningful interpersonal interactions not only between students and faculty but also among peers. These interactions are crucial in developing soft skills such as communication, teamwork, and empathy, all of which are vital in nursing practice (Gherheș et al., 2021).

In clinical and laboratory settings, traditional learning enables nursing students to engage in experiential, hands-on learning that is essential for developing psychomotor and technical skills. Skills such as inserting intravenous lines, conducting physical assessments, administering medications, and performing CPR require tactile practice under the supervision of experienced educators (Lactona & Suryanto, 2021). Through in-person simulations and real-time feedback,

students can refine their techniques and build confidence in their clinical competencies (Yılmaz, et al., 2020).

Moreover, these activities often incorporate scenario-based learning, which enhances critical thinking, decision-making, and prioritization skills in a safe and supportive environment (Rossi et al., 2021). Another notable advantage of traditional learning is the structured nature of its delivery. Schedules, attendance, assessments, and classroom etiquette instill discipline and a sense of professional responsibility in students (Challa, Sayed, & Acharya, 2021). The consistent presence of an instructor and routine educational activities help maintain academic focus and reduce the sense of isolation that some students may experience in more independent learning formats (Hanafy et al., 2021).

Despite its many strengths, traditional learning also faces certain limitations in today's rapidly evolving educational landscape. The rigidity of fixed schedules and physical locations can present challenges for students who are working, have family responsibilities, or live far from educational institutions. Large class sizes may reduce opportunities for individualized attention, while the cost and logistics of maintaining physical infrastructure can strain institutional resources. Moreover, traditional methods may not always accommodate diverse learning styles or foster self-directed learning habits, which are increasingly valued in modern healthcare education (Bdair, 2021). The COVID-19 pandemic further exposed the vulnerabilities of relying exclusively on traditional learning platforms. Lockdowns, health risks, and social distancing measures forced nursing programs around the world to transition rapidly to online modalities, revealing the need for more flexible and resilient educational approaches (Hazaymeh, 2021). In the aftermath, many institutions have reconsidered the exclusive use of traditional models, opting

instead for blended learning approaches that combine the strengths of both face-to-face and digital instruction.

Nonetheless, traditional learning continues to hold a significant place in nursing education. It remains particularly valuable for foundational skill development, professional socialization, and fostering the humanistic aspects of nursing care. As nursing educators explore new pedagogical innovations, the challenge lies in preserving the essential benefits of traditional learning while integrating more flexible and technologically advanced methods. Understanding how traditional learning influences knowledge acquisition, clinical competence, and critical thinking remains crucial to the ongoing development of effective nursing education programs.

2.1.4 Online Learning Platforms in Nursing Education

Online learning platforms have emerged as pivotal tools in modern nursing education, reshaping the delivery of theoretical knowledge and influencing how students engage with content, instructors, and peers. These platforms encompass a wide range of digital technologies and learning management systems (LMS) such as Moodle, Blackboard, Canvas, Google Classroom, and proprietary institutional platforms that facilitate the organization, distribution, and tracking of educational activities. With the growth of the internet and advancements in educational technology, online learning has become a significant complement and, in some cases, an alternative to traditional, face-to-face instruction. Online learning in nursing education typically involves the use of asynchronous tools such as recorded lectures, discussion forums, e-books, and quizzes, as well as synchronous tools like live video conferencing, webinars, and virtual simulations. This mode of delivery provides students with the flexibility to access learning materials at their own pace and from virtually any location, thus addressing barriers related to

time, geography, and personal circumstances. For many nursing students, especially those balancing academic, clinical, and personal responsibilities, this flexibility enhances access and convenience (Hazaymeh, 2021).

A major advantage of online platforms is their capacity to support interactive, multimedia-rich learning experiences. Features such as interactive videos, 3D anatomy visualizations, gamified learning modules, and virtual reality (VR) simulations allow for greater engagement and retention of content (Dahlan et al., 2023; Firdaus et al., 2022). In nursing education, where visualization and repetition of procedures are crucial, these digital tools can simulate clinical scenarios that might be limited or unavailable in real-world settings, especially during health crises such as the COVID19 pandemic (Selvaraj et al., 2021).

Moreover, online learning platforms often foster student centered learning by encouraging self-directed study, critical thinking, and collaboration. Through tools like discussion boards, group chats, collaborative documents, and peer review functions, students can actively participate in knowledge construction rather than passively receiving information. This aligns with constructivist learning theories, which posit that learners develop deeper understanding when they are actively involved in the learning process. Platforms also allow for personalization of content delivery, adaptive assessments, and immediate feedback mechanisms that can enhance student motivation and learning outcomes (Almulla, 2023).

Despite these limitations, the integration of online learning platforms into nursing education continues to expand, especially in response to evolving educational needs and technological capabilities (Abazie & Odikpo, 2024). Institutions are increasingly adopting blended learning models, where online platforms complement in-person instruction, creating a more holistic and

flexible educational experience (Omotade et al., 2022). In this context, online platforms serve not only as content delivery systems but also as environments that promote innovation, collaboration, and critical engagement among nursing students (Oladele et al., 2022).

As the landscape of nursing education evolves, the effective use of online platforms will depend on the intentional design of learning experiences, adequate faculty training, and the continuous evaluation of technological tools in meeting educational objectives (Adesuyi et al., 2023). Understanding the role of these platforms in enhancing nursing students' knowledge and critical thinking skills is essential for developing curricula that are both pedagogically sound and technologically forward-thinking (Abazie & Odikpo, 2024; Oladele et al., 2022).

2.1.5 Knowledge Acquisition in Nursing Education

Knowledge acquisition is a fundamental component of nursing education, forming the basis upon which clinical competence, decision-making, and professional practice are built. It involves the systematic process through which nursing students absorb, retain, and apply theoretical and practical information essential to delivering safe and effective patient care. Given the dynamic nature of healthcare and the rapid advancement of medical science, nursing education must not only impart foundational knowledge but also foster the capacity for continuous learning and critical inquiry.

In the context of nursing, knowledge acquisition spans multiple domains—cognitive (knowledge and comprehension), psychomotor (skills and procedures), and affective (attitudes and values). These domains are interwoven in nursing curricula to ensure that students are not only knowledgeable about diseases, medications, and interventions but are also competent in

executing clinical procedures and demonstrating ethical, compassionate care. Traditionally, knowledge in nursing education has been delivered through lectures, textbooks, laboratory work, and supervised clinical practice.(Kumah et al.,2022)

These methods have been instrumental in building a strong theoretical foundation and exposing students to real-life healthcare environments. In the classroom setting, educators utilize structured content delivery to ensure consistency and accuracy of information, while clinical rotations allow students to translate their classroom learning into practical application (Kumah et al., 2022). However, the complexity of modern healthcare demands more than rote memorization. Nurses are expected to make informed decisions, often in high-pressure settings. As such, the process of knowledge acquisition in nursing must also emphasize higher-order cognitive skills such as analysis, synthesis, evaluation, and problem-solving. To support this, nursing education increasingly incorporates active learning strategies such as case-based learning, simulation, reflective practice, and peer collaboration. These methods engage students more deeply, enabling them to construct knowledge through experience, inquiry, and critical thinking (Dong et al., 2021; Ho et al., 2023).

The rise of online learning platforms has introduced new dimensions to knowledge acquisition. Digital resources such as interactive modules, e-books, video demonstrations, and virtual simulations provide flexible, multimedia-rich opportunities for learning. Students can revisit materials at their own pace, access a variety of content formats that cater to different learning styles, and engage in self-assessment through quizzes and activities. These platforms also support just-in-time learning, allowing students to seek information as needed during clinical placements or study sessions (Rajabalee & Santally, 2021).

Importantly, online and blended learning environments promote self-directed learning, a key factor in long-term knowledge retention and professional growth. Nursing students are encouraged to take ownership of their learning, set personal goals, and utilize critical reflection to deepen their understanding. This approach aligns with adult learning theories, which emphasize autonomy, motivation, and experiential learning as crucial elements in effective education. Despite these benefits, challenges remain. The quality of knowledge acquisition depends heavily on the design and delivery of educational content. Over-reliance on passive learning materials or lack of interactive elements can hinder deep understanding. Furthermore, students may struggle with motivation or comprehension when studying in isolation, especially in fully online environments. These issues highlight the need for well-structured curricula, supportive learning communities, and skilled educators who can facilitate meaningful engagement across different platforms (Maatuk et al., 2022).

2.1.6 Critical Thinking in Nursing Education

Critical thinking is widely recognized as an essential skill in nursing education and professional practice. In a field where clinical decisions often have life-altering consequences, nurses must possess the ability to analyze complex information, evaluate alternatives, and make sound judgments quickly and confidently. As such, the cultivation of critical thinking is not only a core objective of nursing curricula but also a key indicator of a student's readiness to transition from the classroom to the clinical environment. At its core, critical thinking in nursing involves the intentional application of reasoning, analysis, synthesis, and evaluation to guide belief and action. It encompasses both cognitive and affective components, including logical thinking, open-mindedness, curiosity, reflection, and a strong sense of ethical responsibility. In practice, this means that nurses must be able to assess patient conditions, interpret clinical data, prioritize tasks,

and anticipate potential complications, all while communicating effectively and working collaboratively with interdisciplinary teams (Ho et al., 2023).

In nursing education, critical thinking is developed through both theoretical instruction and experiential learning. Traditional methods, such as lectures and textbooks, can introduce critical thinking frameworks and models, but deeper development requires active learning strategies. Techniques like problem-based learning (PBL), simulation exercises, case studies, group discussions, and reflective journaling are designed to challenge students to apply their knowledge in complex, ambiguous scenarios—mimicking the real-life uncertainties of clinical practice (Harianto et al., 2024). Simulation, for example, is widely used to engage students in realistic clinical scenarios where they must assess patient symptoms, make rapid decisions, and reflect on their performance. These exercises encourage learners to link theory with practice while receiving immediate feedback, thus reinforcing critical thinking pathways. Similarly, the Socratic method posing probing, open-ended questions has been shown to stimulate thoughtful dialogue and deeper understanding among nursing students (Ho et al.,2023).

The transition to online and blended learning platforms has also influenced how critical thinking is taught and assessed. Digital tools such as virtual patient scenarios, discussion forums, and interactive quizzes can support critical thinking by encouraging independent exploration, peer collaboration, and continuous self-assessment. For instance, flipped classroom models shift passive content delivery to pre-class online study, reserving in-class time for engaging, problem solving activities. Studies have shown that such models significantly enhance critical thinking, as students arrive prepared and actively engage with material (Yulian, 2021). Moreover, online platforms often integrate analytics that help educators monitor student performance and identify

areas where critical thinking may need reinforcement. When combined with adaptive learning systems, students receive personalized pathways that challenge them appropriately and progressively, which is vital for the development of higher-order thinking skills (Meirbekov et al., 2022).

Despite these innovations, challenges persist. Not all students possess the same level of readiness or motivation for independent, critical learning, especially in online settings where passive engagement is more likely. Furthermore, teaching critical thinking requires instructors to shift from traditional roles as information providers to facilitators of inquiry a transition that demands both pedagogical skill and institutional support (Challa, et al.,2021). Assessment of critical thinking remains another complex issue. Traditional exams may not fully capture a student's reasoning abilities or decision-making processes. As a result, educators are increasingly turning to performance-based assessments, such as Objective Structured Clinical Examinations (OSCEs), reflective essays, and digital portfolios, to measure students' critical thinking more authentically and holistically (Challa, et al.,2021).

2.2 Theoretical framework

This study used Patricia Benner's Novice to Expert Theory, which was introduced in 1982. It is a highly influential nursing theory that focuses on the development of clinical competence over time through experience and education.

Patricia Benner's Novice to Expert Theory

Patricia Benner in 1982 proposed that nurses advance through five distinct stages of proficiency: Novice**,** Advanced Beginner**,** Competent**,** Proficient**,** and Expert**.** Each stage represents a significant shift in the way nurses perceive situations and make clinical decisions. In the novice stage, individuals have no prior experience in the situations in which they are expected to perform. They rely heavily on rules and guidelines to take action and often lack the situational awareness needed for complex decision-making. Their performance tends to be inflexible and governed by clear instructions. The advanced beginner begins to gain some experience and is able to recognize recurring meaningful components in a clinical context. Although their knowledge base is still limited, they start to develop a sense of priority and can make more informed decisions with guidance. At the competent stage, nurses have typically been working in similar job roles for two to three years. They are able to plan their actions based on conscious, abstract, and analytical thinking. Competent nurses can manage complexity and handle many clinical situations with confidence, although their decision-making may still be deliberate and methodical. The proficient stage reflects a deeper understanding of clinical situations. Nurses at this level perceive patient care holistically rather than in fragmented parts. They are more intuitive in their assessments and can anticipate clinical outcomes based on experience, allowing them to respond more quickly and efficiently.

Finally, in the expert stage, nurses possess a vast store of experience and intuitive grasp of clinical situations. Their decision-making is fluid, flexible, and highly skilled. Experts often operate on a deep understanding of patient needs without relying heavily on rules or guidelines. They demonstrate exceptional clinical judgment and can act effectively even in ambiguous or highpressure scenarios. Benner's theory emphasizes the importance of experiential learning in the development of nursing expertise. Rather than focusing solely on theoretical knowledge, she underscores the role of practical experience, mentorship, and reflection in building clinical wisdom. The theory also supports the view that learning is a continuous process, and that competence develops over time through meaningful engagement in real-life clinical settings.

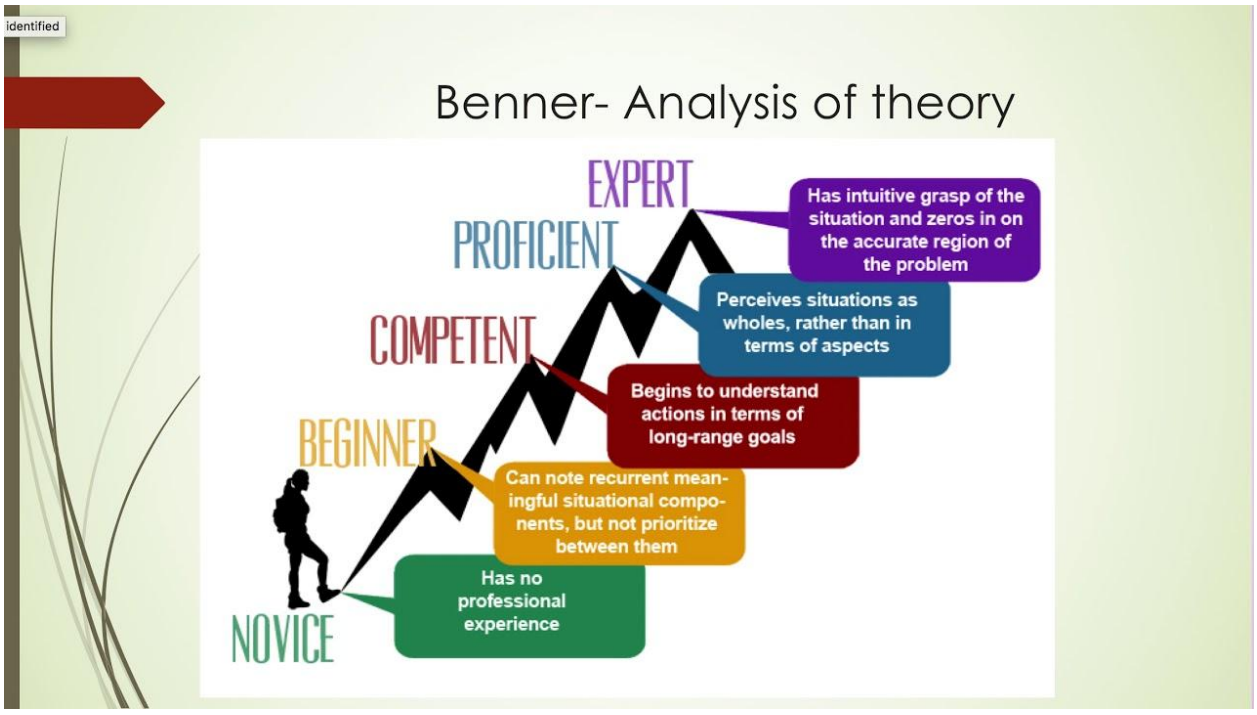

Fig 2.2 Benner's Novice to Expert Model (Benner, 1982).

Application of Benner's Novice to Expert Theory to the Study clinical

Patricia Benner's Novice to Expert Theory serves as a valuable theoretical framework for understanding how nursing students progress in their learning journey—from acquiring basic knowledge to developing advanced critical thinking and decision-making skills. In the context of this study, the theory provides a lens through which the effectiveness of both traditional and online learning platforms can be examined in terms of how they support students' movement along this continuum of skill acquisition.

At the novice level**,** nursing students primarily rely on rules, instructions, and theoretical knowledge delivered through structured formats—common in both traditional lecture-based and online modules. Here, learning platforms are crucial in presenting foundational content clearly and systematically. The role of traditional classroom environments might offer structured discipline, while online platforms provide flexible and self-paced learning which is beneficial for initial knowledge acquisition. As students transition to the advanced beginner and competent stages, they begin to relate classroom learning to real-life clinical experiences. At these stages, learning environments that integrate case-based learning**,** interactive simulations**,** and problem-based learning (PBL) become essential. Online platforms, especially those that incorporate virtual simulations or discussion boards, can offer repeated exposure to clinical scenarios, helping students to develop pattern recognition and reflective skills. At the proficient and expert stages— though less likely to be fully achieved during undergraduate training—the focus shifts toward intuition, holistic understanding, and autonomous clinical judgment. In this regard, platforms that encourage collaborative learning**,** critical debate, and reflective practice**—**such as flipped classrooms, Socratic dialogue methods, and peer feedback—become critical. These tools,

often more accessible through online platforms, promote higher-order thinking and support the development of critical thinking skills.

The theory also underscores the importance of experiential learning**,** mentorship, and **s**ituational engagement**,** which are integral for transforming theoretical knowledge into expert practice. Traditional learning environments that incorporate clinical practicums**,** along with online platforms that simulate clinical decision-making, both contribute uniquely to this developmental process. In essence, applying Benner's theory helps to evaluate how different learning platforms support nursing students at various points in their educational journey. It allows the study to critically assess whether traditional or online methods are more effective in fostering the transition from novice to competent, and potentially proficient, levels—particularly in terms of knowledge retention and critical thinking capacity.

2.3 Empirical review

This section reviewed relevant literatures locally, nationally and internationally based on the objectives of this study.

Perceptions of traditional classroom learning in enhancing knowledge and critical thinking skills**.**

In a quantitative descriptive survey conducted by Adeosun, (2021) in District IV of Lagos State, Nigeria, the study examined the perceptions of the effectiveness of traditional classroom learning specifically through ESL textbooks in enhancing students' knowledge and critical thinking (CT) skills. The study population consisted of ESL textbooks and the teachers who use them in traditional classroom instruction. A total of five widely recommended Senior Secondary Two (SS2) ESL textbooks and forty ESL teachers formed the sample. A 90-item structured questionnaire was used for data collection, with a reliability coefficient of 8.3. Descriptive statistics, including tables, percentages, means, and standard deviation, were used to analyze the data. The findings revealed that teachers perceive a strong connection between CT development and ESL instruction within the traditional classroom setting (Adeosun, 2021).

However, the presence of CT components in the textbooks was found to be minimal. Although teachers made moderate efforts to integrate CT skills through textbook use, their effectiveness was limited by several challenges. The study concluded that while traditional classroom learning has potential for enhancing CT and knowledge acquisition, its success depends heavily on the quality of instructional materials. It recommended that school administrators, policymakers, and textbook authors prioritize the inclusion of CT elements in ESL materials to maximize the impact of traditional learning In a quasi-experimental study by Sanad et al. (2023) at a nursing college in

Cairo Egypt, the researchers explored the effects of Team-Based Learning (TBL) within traditional classroom settings on nursing students' academic engagement and cognitive development. Using a quasiexperimental design and purposive sampling, the study assessed the impact of TBL on students' critical thinking and academic performance. The findings revealed that TBL significantly enhanced student engagement, which was positively associated with improved critical thinking dispositions and academic achievement. The authors concluded that incorporating TBL in traditional instruction fosters essential interpersonal and problem-solving skills among nursing students.

In another cross-sectional and descriptive-correlational study by Nurakhir et al. (2020), among undergraduate nursing students from a nursing school in the Philippines, the effectiveness of classroom debates as a traditional instructional method was examined in relation to students' critical thinking and communication skills. Employing a qualitative research design and purposive sampling, the researchers found that engaging in structured debates allowed students to articulate their ideas clearly and consider diverse perspectives. The study concluded that such interactive traditional strategies help refine critical thinking and enhance oral communication, which are vital competencies in nursing education.

In contrast, a systematic review conducted by Chen et al. (2022) compared the learning outcomes of students in flipped classroom settings versus traditional classroom environments. Drawing data from multiple empirical studies with varied sampling techniques, the review found that students in flipped classrooms reported greater satisfaction, increased enjoyment, and reduced boredom. These factors contributed to better knowledge retention and enhanced critical thinking skills. The authors concluded that while traditional classrooms provide foundational learning,

interactive and participatory methods like those in flipped classrooms may offer superior cognitive benefits.

In a quasi-experimental pre-test and post-test study conducted on 40 undergraduate/four-year students of nursing in Borujen Nursing School/Iran by Ahmady and Shahbazi (2020), the researchers examined the impact of explicitly teaching critical thinking within a traditional nursing curriculum. Using a pre-post experimental design and random sampling, they observed significant improvements in students' decision-making abilities and critical thinking outcomes following structured instructional interventions. The study concluded that when critical thinking is deliberately integrated into traditional classroom teaching, it significantly enhances students' cognitive skill development.

In another study by Bam et al. (2021), the integration of traditional educational approaches with real-world clinical learning was explored. Through a mixed-methods design and stratified random sampling, the researchers assessed how blending classroom instruction with practical clinical experiences influenced students' critical reasoning. The findings highlighted that such integration supports the development of critical thinking and decision-making skills, reinforcing the effectiveness of traditional instruction when coupled with experiential learning (Bam et al., 2021).

However, in a study by Kantek and Yıldırım (2020), the limitations of traditional classrooms in nurturing critical thinking were examined. Using a descriptive research design, the study found that the absence of facilitative teaching strategies and the reliance on high-stakes examinations often led to rote memorization rather than deep analytical thinking. The researchers concluded

that traditional classrooms can hinder critical thinking development unless educators are trained to apply more interactive and reflective pedagogies. (Kantek & Yildirim 2020).

Overall, these studies collectively suggest that traditional classroom methods, particularly when enhanced with active learning strategies such as TBL, debates, and structured support, can significantly contribute to nursing students' knowledge acquisition and critical thinking. However, the effectiveness of these methods depends greatly on the instructional approach and the degree of student engagement. As such, integrating innovative pedagogical techniques within traditional frameworks is essential to meet the evolving cognitive demands of nursing education

Students' perceptions of online learning platforms in knowledge acquisition and critical thinking development

In a quantitative descriptive study conducted among undergraduate students by Balogun et al. (2023) at the University of Ilorin, Nigeria, the research investigated students' perceptions regarding the use of e-learning systems during the COVID-19 pandemic. The study aimed to identify factors influencing the use of e-learning platforms, examine students' views on the quality of the systems used, and assess lecturers' attitudes towards their usage. A three-stage sampling

Technique purposive, random, and proportionate was employed to select 333 student respondents. Data were collected using a structured questionnaire and analyzed through descriptive statistics, including means. The findings revealed that the use of e-learning systems was high among students, primarily influenced by the institutional policy mandating its use during the pandemic. Students perceived the quality of the e-learning system positively, and lecturers were also reported to have demonstrated favorable attitudes towards its implementation. The study

concluded that the adoption of e-learning at the University of Ilorin was successful during the pandemic and recommended a blended learning model (virtual and face-to-face) for future implementation. It also emphasized the need for continued investment by educational stakeholders to maintain the gains achieved through digital learning, highlighting the complementary role of traditional classroom learning in fostering deeper knowledge and critical thinking

In a quantitative descriptive study conducted by Lebese and Mhlongo (2024) in South Africa, the research examined the transformative role of e-learning technologies in the country's educational system, with a specific focus on their impact on students' critical thinking skills. Data were collected from 55 university students enrolled between 2020 and 2022, using a structured survey questionnaire designed to assess how e-learning tools contributed to the development of critical thinking. Descriptive analysis of the data revealed that students showed a strong preference for elearning resources and agreed on their positive influence in enhancing cognitive and analytical abilities. Although the study noted limitations related to self-reported data and demographic biases, it emphasized the need for strategic integration of e-learning tools to maximize critical thinking outcomes. The findings suggest that while traditional classroom learning remains important, the incorporation of digital platforms into educational settings offers significant cognitive benefits, equipping students to better navigate complex real-world challenges. This study reflects the evolving educational landscape, where traditional methods may be complemented or transformed by technology-enhanced learning strategies to foster deeper critical engagement

Moreover, the meta-analysis conducted by Lee et al. (2022) illustrated that non-traditional teaching methods, including those employed in online learning environments, significantly influence critical thinking enhancement in nursing students. They found that methods such as concept mapping and reflective writing promoted not only knowledge retention but also critical thinking abilities among nursing students. This emphasizes the importance of integrating diverse instructional strategies within online platforms to ensure a holistic learning experience.

Conversely, Bayram et al. (Bayram et al., 2022) conducted a multicenter study that indicated perceptions around online distance education, emphasizing that high motivation for critical thinking can lead to better problem-solving skills among students. Their study found that the integration of nursing diagnoses in distance learning correlated positively with students' motivation to engage critically with their studies (Bayram et al., 2022). This underscores the potential of online platforms to foster critical thinking when aligned with students' motivations and instructional support.

Nursing students' perceptions of online learning reflect a nuanced landscape marked by both opportunities and challenges. While online platforms can foster critical thinking and knowledge acquisition, ensuring these educational tools are effectively designed and supported is pivotal for optimizing learning outcomes. The findings suggest a continued need for innovation in online education strategies that stimulate critical thinking and support learning environments that embrace the technological realities these students face.

Strengths and limitations of both traditional and online learning platforms as perceived by nursing students:

In a descriptive cross-sectional online survey of nursing students of Department of Nursing Science, Nnamdi Azikiwe University Awka, Nnewi Campus, Nigeria. A multistage sampling technique was used for the study. Data were collected using Google Forms from 429 nursing students. Descriptive data of respondents were presented in tables, charts, percentages, means, and standard deviation, while the inferential data were tested with Chi-square at a significance level of $P< 0.05$. Results: Mean age is 23.15± 3.10 years, 396(92.3%) had positive perception and 396(92.3%) had a good attitude towards online learning. Result shows that there is a relationship between the perception of online learning and attitudes toward online learning as all the variables showed a statistically significant relationship.

In a study conducted by Enyoojo et al. (2024), data were collected from 300 undergraduate students across four departments anatomy, medical laboratory, nursing, and medicine—at Enugu State University of Science and Technology in Eastern Nigeria. A structured questionnaire was distributed to assess students' learning experiences and satisfaction with online learning platforms. The results indicated that sociodemographic factors, such as course of study and gender, significantly influenced the students' learning experience and satisfaction with the online platform. Specifically, 63.1% of respondents strongly agreed that the online learning platform effectively delivered medical course content, with a mean value of 4.15 for user learning experience.

While other factors did not show a significant impact, the study emphasized that the perception of the online learning experience was closely tied to the students' academic discipline and sex. The findings suggested that traditional curriculum design and content delivery methods must

consider these sociodemographic variations to maximize student satisfaction and learning outcomes. The study concluded that online learning platforms are a successful model for medical education and recommended their broader implementation in medical institutions. However, the data also suggest that traditional learning environments may still be necessary to fully engage and support all students, depending on their specific educational needs and backgrounds

In a cross-sectional study conducted by Ogolodom et al. (2023**)**, the experiences of 540 nursing and radiography undergraduate students in Nigerian universities were examined regarding online learning during the COVID-19 pandemic. The study utilized a questionnaire-based survey and applied both descriptive and inferential statistics, with a significance level set at $p < 0.05$. The findings revealed that 41.3% of the respondents perceived online learning to be slightly stressful, while only 7.4% considered it extremely stressful. The challenges reported by the students included financial constraints (29.6%), lack of internet access (22.2%), inadequate technical skills (14.8%), and poor communication with lecturers and peers (5.6%).

Despite these challenges, the majority of students exhibited positive attitudes toward the online learning method, viewing it as beneficial to their educational progress. These positive perceptions suggest that online learning, even in the medical field where traditional methods are typically preferred, can enhance students' knowledge acquisition. However, the study highlighted that the success of online education is contingent upon addressing the various barriers students face, such as access to technology, internet connectivity, and communication with instructors. The findings underscore the need for a more flexible approach to integrating online learning with traditional methods to support critical thinking development in nursing and radiography students

In a cross-sectional survey conducted by Gismalla et al. (2021), 358 undergraduate medical students from the Faculty of Medicine at the University of Gezira, Sudan, were surveyed using a self-administered online questionnaire between May 10 and 25, 2020. The survey was distributed via e-mail and social media platforms, including Facebook and WhatsApp. Results indicated that 87.7% of students agreed that the university's closure was a necessary measure to control the spread of COVID-19. Approximately 64% of the students perceived e-learning as the best alternative during the pandemic lockdown.

However, significant challenges to the effective implementation of e-learning were noted. Factors such as internet bandwidth and connectivity limitations, unfamiliarity with e-learning systems, lack of technical support, time flexibility issues during online exams, and the absence of face-toface interaction were highlighted as barriers to successful online education. The study also found that the students' level of education (pre-clerkship vs. clerkship) and their place of residence had a significant correlation with their opinions regarding e-learning. Despite these challenges, most medical students had a positive perception of e-learning, viewing it as a suitable solution for continuing education during the pandemic.

The study concluded that while e-learning had positive acceptance, several barriers still hindered its full implementation, particularly in a resource-limited setting. The authors recommended that the challenges of e-learning be systematically evaluated, and effective strategies be developed to address these obstacles in order to enhance the effectiveness of online medical education

Similarly, Ali et al. (2022) highlighted that gerontological nursing students experienced significant levels of stress linked to online learning during the pandemic, attributing these stressors to a lack of emotional support and feelings of isolation inherent in online education. The

study's qualitative evaluations indicated that female nursing students, in particular, faced unique challenges that substantially impacted their emotional well-being and overall satisfaction with educational delivery (Ogechi & Linda, 2024). This research underscores the limitations of online platforms, especially in cultivating the supportive learning environments that are essential in nursing education.

while online learning platforms present benefits such as flexibility and access, nursing students frequently perceive significant limitations, especially in terms of satisfaction, engagement, and emotional support. The results from these studies highlight the ongoing need for educational institutions to integrate and enhance traditional learning elements into online frameworks to better accommodate the distinct challenges nursing students face during their education. Balancing both educational approaches may foster improved learning environments that address the complexities of nursing education (Adongo et al., 2023)

2.4 summary of literature review

The literature highlights the evolving landscape of nursing education, particularly emphasizing the shift from traditional classroom-based instruction to the integration of digital and online learning platforms. Traditional learning environments, characterized by face-to-face lectures, hands-on clinical practice, and direct interaction with instructors and peers, have long been valued for their ability to foster personal engagement and practical skill development. However, they also face limitations such as inflexibility in scheduling and the inability to consistently simulate diverse clinical scenarios. Online learning platforms have emerged as powerful tools in nursing education, offering flexibility, accessibility, and interactive content that supports independent and self-paced learning. These platforms utilize multimedia resources, discussion forums, virtual simulations, and assessments to enhance student engagement and provide

personalized learning experiences. Research suggests that when effectively implemented, online learning can equal—or even surpass—traditional methods in facilitating knowledge acquisition and critical thinking development. Knowledge acquisition in nursing education involves not just memorization, but the application of theoretical concepts to real-world clinical situations. Both traditional and online platforms contribute to this process in different ways. Traditional methods allow for immediate feedback and hands-on experience, while online platforms promote deeper learning through interactive modules and self-directed study.

Critical thinking is identified as a core competency in nursing, essential for effective decision-making and patient care. Literature emphasizes the importance of incorporating active learning strategies—such as case studies, simulations, and reflective exercises—across both traditional and online platforms to promote critical thinking. The digital transformation of nursing education has introduced innovative tools like virtual simulations and adaptive learning systems that offer students dynamic environments to develop and apply their reasoning skills.

CHAPTER THREE

RESEARCH METHOD

This chapter describes the research method that the researcher adopted in conducting the study. The various components of the research methodology were discussed under their respective headings, including the research design, study setting, target population, sample and sampling technique, instruments for data collection, validity and reliability of the instruments, method of data collection, method of data analysis, and ethical considerations.

3.1 Research Design

A descriptive cross-sectional research design was used for this study. Cross-sectional studies are observational in nature and analyze data from a population at a specific point in time. They are often used to measure the prevalence of health outcomes, understand determinants of health, and describe features of a population (Wang & Cheng, 2020). The study design comprised a description of the occasions, circumstances, and occurrence rates of particular phenomena during the study period.

3.2 Research Setting

The study was conducted among nursing students at the University of Benin (UNIBEN), located in Benin City, the capital of Edo State, Nigeria. Nigeria, situated in West Africa, is the most populous country on the continent and comprises 36 states and the Federal Capital Territory (Abuja). The country has a robust tertiary education system comprising over 170 universities, which include federal, state, and private institutions (National Universities Commission (NUC), 2024). In addition, Nigeria has more than 300 nursing and midwifery training institutions,

regulated by the Nursing and Midwifery Council of Nigeria (NMCN), offering diploma and degree programmes in nursing education.

Edo State, created in 1991 from the former Bendel State, is located in the South-South geopolitical zone of Nigeria. It shares boundaries with Kogi State to the northeast, Delta State to the southeast, and Ondo State to the west, while its southern boundary opens to the Atlantic Ocean. The state's capital, Benin City, serves as one of Nigeria's historical and cultural centers, renowned for its ancient Benin Kingdom and vibrant arts and crafts. Edo State hosts several higher institutions of learning, including the University of Benin (federal), Ambrose Alli University (state), and several polytechnics, colleges of education, and schools of nursing and midwifery.

The University of Benin (UNIBEN), a federal university, was established in 1970 as an Institute of Technology and later accorded full university status by the National Universities Commission (NUC) on 1st July 1971. It is one of Nigeria's foremost federal universities, offering undergraduate and postgraduate programmes across diverse disciplines. The university operates two main campuses — Ugbowo Campus (the main campus) and Ekenwan Campus. The Ugbowo Campus houses most faculties, including the College of Medical Sciences, while the Ekenwan Campus accommodates the Faculty of Education and other departments.

As of 2024, UNIBEN had a student population of over 77,000, comprising full-time and part-time students across 15 faculties, numerous departments, and several institutes and centers. Among these faculties is the School of Basic Medical Sciences, established in 2003, which includes seven departments: Nursing Science, Anatomy, Medical Biochemistry, Physiology, Medical Laboratory Science, Physiotherapy, and Radiology.

The Department of Nursing Science, which constituted the focus of this study, commenced in the 2007/2008 academic session with an initial enrollment of 20 students admitted through the Joint Admissions and Matriculation Board (JAMB) and Post-University Matriculation Examination (Post-UME). Since then, the department has experienced significant growth in enrollment, academic staff strength, and infrastructure, contributing meaningfully to nursing education, research, and professional practice in Nigeria.

3.3 Target Population

The target population for this study consisted of 701 students from 200 to 500 levels who had been exposed to both traditional and online learning platforms in the Department of Nursing Science at the University of Benin (UNIBEN), Benin City, Edo State.

Table 3.1: Study of The Target Population

Academic level	**Total number of students**
500 level	160
400 level	174
300 level	190
200 level	177
Total	**701**

Source: *Department of nursing, University of Benin*

3.4 Sample Size

Determination of sample is done to make the study less vigorous and streamline it to sample size that would be required for the study. The sample size is the number of subjects or participant required and to which the study findings will be generalized.

The "Cochran Formula" or "Cochran's Sample Size Formula" was used to calculate the sample size. It was developed by William Gemmell Cochran, a Scottish-American statistician, in the

1950s. Cochran was a prominent figure in statistics and sampling theory, and his work has had a significant impact on the field.

Calculation of the sample size using the formula:

$n = (N \times Z^2 \times p \times (1-p)) / (E^2 \times (N-1) + Z^2 \times p \times (1-p))$

Where: n = total sample size

N = total population size

Z = Z-score (confidence level, usually 1.96 for 95% confidence) p = proportion of population in each stratum (Assume equal proportion (p): p = 0.5)

E = margin of error E = 0.05 (5% margin of error)

Steps for calculating the sample size using Stratified Random Sampling

Calculate the total population size (N):

N = Level 1 + Level 2 + Level 3 + Level 4

= 160 + 174 + 190 +177

= 701

Calculate the sample size (n) using the formula: $n = (N \times Z^2 \times p \times (1-p)) / (E^2 \times (N-1) + Z^2 \times p \times (1-p))$ $n = (701 \times (1.96)^2 \times 0.5 \times (1-0.5)) / ((0.05)^2 \times (701-1) + (1.96)^2 \times 0.5 \times (1-0.5))$ $n = (701 \times 3.8416 \times 0.25) / (0.0025 \times 700 + 3.8416 \times 0.25)$ $n = 701.0.9604 / (1.75 + 0.9604)$

$n = 673.141 / 2.7104$ n

≈ 248

3.5 Sampling Technique

The convenience sampling technique was used by the researcher to select respondents for the study in the Department of Nursing Science at the University of Benin (UNIBEN), Benin City, Edo State. Convenience sampling is a non-probability sampling method in which the researcher selects participants based on their accessibility and availability, without following a specific order. This technique allowed the researcher to choose individuals who were most conveniently and economically available to participate in the study. The researcher adopted this method because it was anticipated that not all students would be present at the same time due to varying schedules and academic activities. Therefore, the research instruments were distributed to students who were available at the time of data collection. The researcher approached and included those who were closest and most easily accessible during the data collection period.

3.6 Instrument for Data Collection

The instrument for data collection in this study was a self-structured questionnaire, which was developed based on the objectives of the study. The questionnaire consisted of four sections, with questions that were carefully drafted, sequenced, and constructed to obtain in-depth information that was useful and relevant to the study.

Section A: consist of the demographic data of the participants

Section B: nursing students' perceptions of traditional classroom learning

Section C: nursing students' perceptions of online learning platforms

Section D: strengths and limitations of both traditional and online learning platforms

3.7 Validity of the Instrument

The validity of the instrument pertained to its capability to accurately measure the intended construct or concept (Surucu & Maslakci, 2020). The researcher assessed various types of validity such as content, construct, criterion, and face validity to ensure the accuracy and appropriateness of the instrument. For the purpose of this study, face and content validity were employed to validate the research tool. The questionnaire was reviewed by the project supervisor, and necessary adjustments were made by the researcher before commencing the main study.

3.8 Reliability of the Instrument

The reliability of an instrument referred to its stability and consistency in delivering uniform outcomes when assessing the same criteria under identical conditions (Surucu & Maslakci, 2020). It evaluated how consistently the instrument produced similar results across multiple trials. A reliable instrument was one that could yield the same results if the behavior was measured again using the same scale. In this study, the Cronbach's alpha reliability technique was employed to assess the internal consistency of the research instrument. The researcher conducted reliability testing by distributing 25 questionnaires constituting approximately 10% of the total sample size of 248 to undergraduate Nursing students of the University of Benin Teaching Hospital, Benin City, who were outside the main study population. A reliability coefficient of 0.71 was obtained, and the instrument was considered reliable.

3.9 Method of Data Collection

A total of 248 well-structured questionnaires containing questions related to the research study were self-administered to the sample population in the Department of Nursing Science at the University of Benin (UNIBEN), Benin City, Edo State. The researcher personally gained access to the students through the departmental authorities, who granted permission for the data collection exercise. The researcher then approached each student during their break period (12pm -1pm) with information about the research, including the objectives of the study. Those who expressed interest were given the questionnaire along with a brief explanation of what was required of them. All respondents were assured of confidentiality and anonymity. The researcher was present while the respondents completed the questionnaires to provide clarification when needed and to retrieve the completed questionnaires

3.10 Method of Data Analysis

The data collected were analyzed using the Statistical Package for the Social Sciences (SPSS) version 27.0. Descriptive statistics such as mean, frequency, and percentages were computed to summarize the data. Hypothesis testing was conducted using the Chi-square test of association, with the level of significance set at $p < 0.05$. The results of the analyses were presented using tables, graphs, frequencies, and percentages to provide a clear overview of the findings.

3.11 Ethical Considerations

The researcher was mindful of ethical and moral principles regarding the collection of information from respondents. Privacy, one of the most important aspects of human rights, was upheld throughout the study. Permission to carry out the study was obtained from the College of

Medicine Ethical Clearance Committee, University of Benin (UNIBEN), before data collection commenced.

Confidentiality: Respondents' information was treated confidentially, and no names or addresses were requested in the questionnaire. Participants were informed that their responses would remain confidential and be used solely for research purposes. No personal identifiers were included in any documents or questionnaires to maintain anonymity.

Voluntary Participation: Participants were informed of their right to participate voluntarily without facing any penalties or bias. They were given the freedom to withdraw or decline to provide information at any stage if they felt uncomfortable or unsure.

Avoidance of Plagiarism: Proper citation of all authors used in the study was ensured, both within the body of the content and on the reference page.

CHAPTER FOUR

RESULT AND FINDINGS

This chapter presents the data collected on the perceived impact of traditional and online learning platforms on nursing students' knowledge and critical thinking skills in a tertiary institution in Benin City**.** A total of 245 questionnaires were distributed to nursing students from 200 level to 500 level at the University of Benin. Out of these, 242 questionnaires were properly filled and valid for data analysis, giving a response rate of 98.8%.

Table 4.1: Socio-demographic characteristics of respondents

Variable	Categories	Frequency (n = 242)
Age (years)	16–20	93
	21–25	116
	26–30	31
	Above 30	2
Gender	Male	29
	Female	213
Marital Status	Single	241
	Married	1
Level of Study	200 Level	33
	300 Level	67
	400 Level	43
	500 Level	99
Religion	Christianity	179
	Islam	62
	Traditional	1
	Other	0
Ethnic Group	Igbo	67
	Yoruba	46
	Hausa	5
	Bini	91
	Other	33
Place of Residence	On campus	106
	Off campus	136
Duration of Enrollment in Nursing Program	1–2 years	33
	3–4 years	110
	More than 4 years	99

Table 4.1 shows the socio-demographic data of respondents. A total of 242 nursing students participated in the study. The majority of the respondents (47.9%) were aged between 21 and 25 years, followed by 38.4% who were between 16 and 20 years. A smaller proportion were aged 26 to 30 years (12.8%), while only 0.83% were above 30 years of age. In terms of gender distribution, females constituted the overwhelming majority (88%), while males accounted for only 12%. Regarding marital status, almost all respondents were single (99.6%), with just 0.41% being married. Considering the academic level, 40.9% of the respondents were in their 500 level, 27.7% were in 300 level, 17.8% were in 400 level, and 13.6% were in 200 level. Religious affiliation showed that 74% of the respondents identified as Christians, 25.6% as Muslims, and 0.41% adhered to traditional beliefs, with no respondent selecting "Other." For ethnic distribution, 37.6% of the respondents were Bini, 27.7% were Igbo, 19% were Yoruba, 2.07% were Hausa, while 13.6% belonged to other ethnic groups. Regarding their place of residence, 56.2% of the students lived off campus, while 43.8% resided on campus. Finally, in terms of the duration of enrollment in the nursing program, 45.5% had been enrolled for 3 to 4 years, 40.9% had been in the program for more than 4 years, and 13.6% had been enrolled for 1 to 2 years.

Nursing students' perceptions of traditional classroom learning:

in relation to enhancing their knowledge and critical thinking skills in a tertiary institution in Benin City?

Table 4.2 perceived impact of traditional learning platforms on knowledge and critical thinking skills

Variables	Strongly Agree (%)	Agree (%)	Disagree (%)	Strongly Disagree (%)	Mean	decision
Traditional classroom teaching improves my understanding of nursing concepts.	141 (58.3)	94 (38.8)	6 (2.5)	1	3.5	high
Face-to-face lectures allow me to ask questions and clarify difficult topics.	73 (30.2)	109 (45.0)	46 (19.0)	14	3	high
Traditional lectures help to enhance my critical thinking skills.	81 (33.5)	119 (49.2)	33 (13.6)	9	3.1	high
Real-time feedback during classes improves my academic performance.	103 (42.6)	65 (26.9)	47 (19.4)	27	3	high
Group discussions in traditional classrooms strengthen my ability to think critically.	77 (31.8)	89 (36.8)	43 (17.8)	33	2.9	high
Traditional classroom settings motivate me to actively participate in learning.	93 (38.4)	117 (48.3)	11 (4.5)	21	3.2	high
The structure of traditional learning promotes better retention of knowledge.	56 (23.1)	97 (40.1)	73 (30.2)	16	2.8	high
Teachers in traditional settings effectively stimulate analytical thinking	63 (26.0)	81 (33.5)	66 (27.3)	32	2.7	high
Physical classroom interaction enhances peer learning and idea exchange.	87 (36.0)	101 (41.7)	39 (16.1)	15	3.1	high
Traditional classroom learning offers a conducive environment for critical discussions.	72 (29.8)	93 (38.4)	56 (23.1)	21	2.9	high

mean cut off=2.5

Table 4.2 shows the perceived impact of traditional learning platforms on knowledge and critical thinking skills. Traditional classroom teaching improves understanding of nursing concepts (mean = 3.5**),** traditional classroom settings motivate active participation in learning (mean = 3.2**),** traditional lectures help to enhance critical thinking skills (mean = 3.1**),** physical classroom interaction enhances peer learning and idea exchange (mean = 3.1**),** face-to-face lectures allow students to ask questions and clarify difficult topics (mean = 3.0), real-time feedback during classes improves academic performance (mean = 3.0**),** group discussions in traditional classrooms strengthen critical thinking ability (mean = 2.9**),** traditional classroom learning offers a conducive environment for critical discussions (mean = 2.9), the structure of traditional learning promotes better retention of knowledge (mean = 2.8**),** and teachers in traditional settings effectively stimulate analytical thinking (mean = 2.7**).**

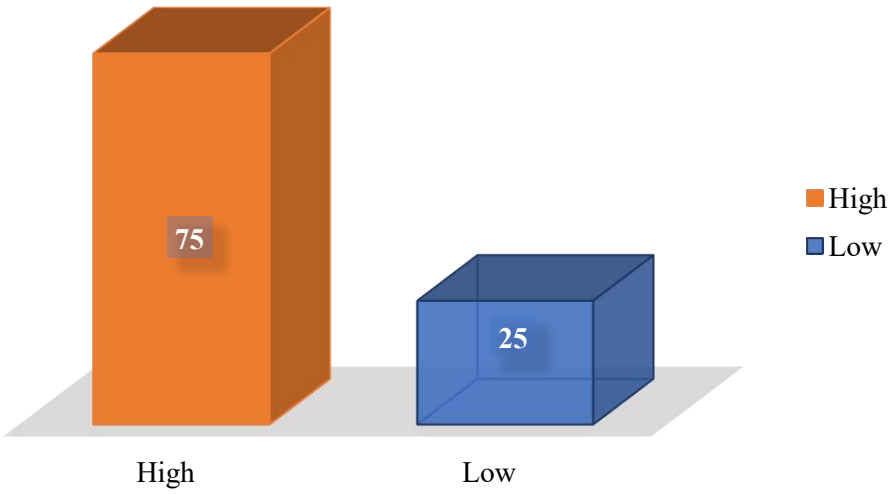

Figure 4.1 shows the perceived impact of traditional learning platforms on knowledge and critical thinking skills. The majority of respondents (181, 75%**)** reported a high perceived impact, while 61 respondents (25%) indicated a low perceived impact

How do nursing students in a tertiary institution in Benin City perceive online learning platforms in terms of knowledge acquisition and critical thinking development?

Table 4.3 Perceived impact of online learning platforms on knowledge and critical thinking skills

Variables	Strongly Agree (%)	Agree (%)	Disagree (%)	Strongly Disagree (%)	Mean	decision
Online learning platforms make it easy to access diverse educational resources.	89 (36.8)	103 (42.6)	43 (17.8)	7 (2.9)	3.1	high
Flexibility in online learning helps improve my study habits	67 (27.7)	97 (40.1)	44 (18.2)	34 (14.0)	2.8	high
Online classes allow me to revisit recorded lectures to strengthen my knowledge.	81 (33.5)	149 (61.6)	9 (3.7)	3 (1.2)	3.3	high
The use of multimedia tools in online platforms improves my understanding of concepts.	94 (38.8)	123 (50.8)	19 (7.9)	6 (2.5)	3.3	high
Online learning has enhanced my ability to study independently.	99 (40.9)	103 (42.6)	23 (9.5)	17 (7.0)	3.2	high
Online discussion forums encourage critical thinking among students.	66 (27.3)	91 (37.6)	78 (32.2)	7 (2.9)	2.9	high
Online quizzes and assignments enhance my knowledge retention.	87 (36.0)	92 (38.0)	49 (20.2)	14 (5.8)	3.0	high
Online platforms promote self-directed learning that strengthens critical analysis skills.	78 (32.2)	97 (40.1)	46 (19.0)	21 (8.7)	3.0	high
Internet-based simulations and case studies help develop critical thinking.	73 (30.2)	101 (41.7)	45 (18.6)	23 (9.5)	2.9	high
Online classes allow me to pace my learning for better comprehension.	86 (35.5)	107 (44.2)	32 (13.2)	17 (7.0)	3.1	high

mean cut off=2.5

Table 4.3 shows the perceived impact of online learning platforms on knowledge and critical thinking skills. Online learning platforms make it easy to access diverse educational resources

(mean = 3.1**),** online classes allow me to revisit recorded lectures to strengthen my knowledge (mean = 3.3**),** the use of multimedia tools in online platforms improves my understanding of concepts (mean = 3.3**),** online learning has enhanced my ability to study independently (mean = 3.2**),** online classes allow me to pace my learning for better comprehension (mean = 3.1**),** online quizzes and assignments enhance my knowledge retention (mean = 3.0**),** online platforms promote self-directed learning that strengthens critical analysis skills (mean = 3.0), online discussion forums encourage critical thinking among students (mean = 2.9), internet-based simulations and case studies help develop critical thinking (mean = 2.9), and flexibility in online learning helps improve my study habits (mean = 2.8)

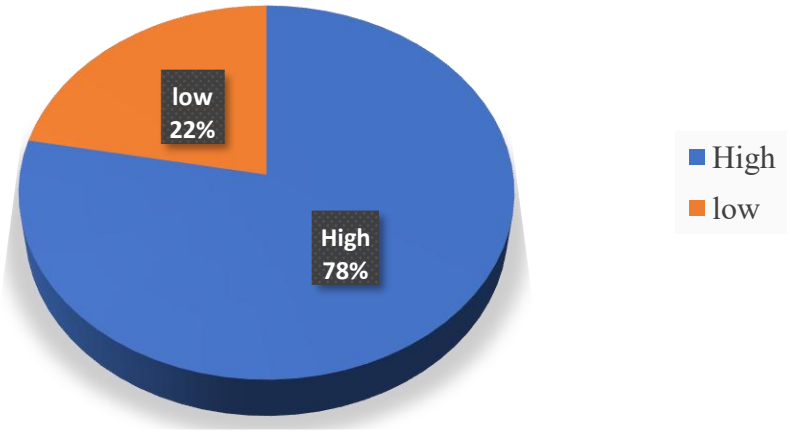

Figure 4.2 shows the perceived impact of online learning platforms on knowledge and critical thinking skills. A majority of respondents (188, 78%**)** reported a high perceived impact, while 54 respondents (22%) indicated a low perceived impact.

What are the strengths and limitations of both traditional and online learning platforms as perceived by nursing students in a tertiary institution in Benin City**?**

Table 4.4 strengths and limitations of traditional and online learning platforms.

Variables	Strongly Agree	Agree	Disagree	Strongly Disagree	Mean	decision
Traditional classroom learning provides better real-time feedback than online learning.	79 (32.6)	87 (36.0)	59 (24.4)	17 (7.0)	2.9	Accepted
Online learning offers greater flexibility in learning schedules compared to traditional classrooms.	98 (40.5)	121 (50.0)	14 (5.8)	9 (3.7)	3.3	Accepted
Poor internet connectivity often disrupts the effectiveness of online learning.	121 (50.0)	111 (45.9)	7 (2.9)	3 (1.2)	3.4	Accepted
Traditional classroom environments encourage more effective critical thinking discussions than online platforms	87 (36.0)	56 (23.1)	78 (32.2)	21 (8.7)	2.9	Accepted
Online learning platforms provide access to a wider range of educational resources	91 (37.6)	131 (54.1)	12 (5.0)	8 (3.3)	3.3	Accepted
Traditional classroom settings allow for more hands-on practical experiences than online learning.	96 (39.7)	112 (46.3)	21 (8.7)	13 (5.4)	3.2	Accepted
Online learning demands higher levels of self-discipline compared to traditional learning.	46 (19.0)	96 (39.7)	61 (25.2)	39 (16.1)	2.6	Accepted
Traditional learning environments are more structured and supervised than online platforms.	88 (36.4)	78 (32.2)	53 (21.9)	23 (9.5)	3.0	Accepted
Online platforms make it easier to balance studies with personal commitments compared to traditional learning.	25 (10.3)	131 (54.1)	68 (28.1)	18 (7.4)	2.7	Accepted
Traditional learning methods are more effective for building communication and interpersonal skills than online learning	78 (32.2)	96 (39.7)	59 (24.4)	9 (3.7)	3.0	Accepted

mean cut off=2.5

Table 4.4 shows the strengths and limitations of traditional and online learning platforms. Poor internet connectivity often disrupts the effectiveness of online learning (mean = 3.4), online learning offers greater flexibility in learning schedules compared to traditional classrooms (mean = 3.3), online learning platforms provide access to a wider range of educational resources (mean = 3.3), traditional classroom settings allow for more hands-on practical experiences than online learning (mean = 3.2), traditional learning environments are more structured and supervised than online platforms (mean = 3.0), traditional classroom learning provides better real-time feedback than online learning (mean = 2.9), traditional classroom environments encourage more effective critical thinking discussions than online platforms (mean = 2.9), traditional learning methods are more effective for building communication and interpersonal skills than online learning (mean = 3.0), online learning demands higher levels of self-discipline compared to traditional learning (mean = 2.6), and online platforms make it easier to balance studies with personal commitments compared to traditional learning (mean = 2.7).

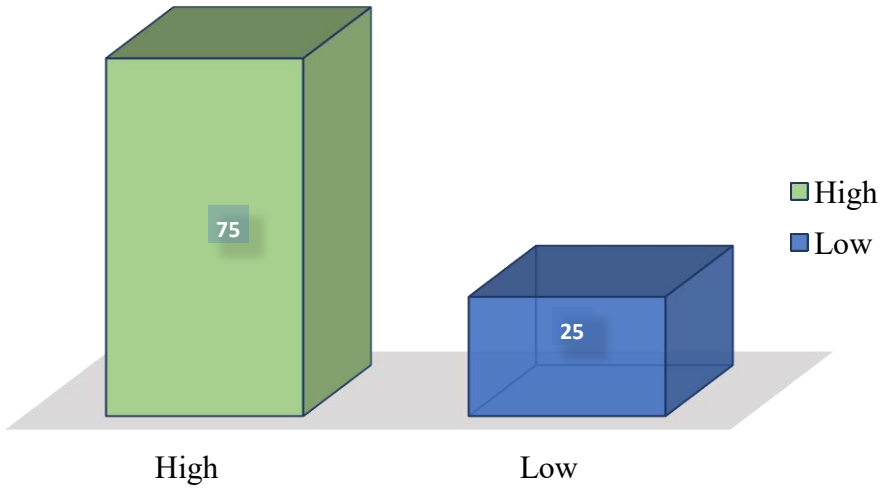

Figure 4.3 strengths and limitations of traditional and online learning platforms.

Figure 4.3 shows the perceived strengths and limitations of traditional and online learning platforms. A majority of respondents (75%) perceived a high level of strength, while 25% indicated a low level.

Table 4.5: There is no significant relationship between nursing students' perceptions of traditional classroom learning and online learning platforms on students' knowledge

Traditional knowledge	**Online knowledge**		**Test Statistics (χ^2)**	**df**	**P value**	**Decision**
	High	**Low**				
High	181	61	24.5385	1	0.0000007	Rejected
Low	188	54				

CHAPTER FIVE

DISCUSSION OF FINDINGS.

This chapter discusses the major findings of the research compared with the literature reviewed, the implication for nursing, summary, conclusion, Recommendations and Suggestions for further Studies.

5.1. Discussion of Findings

The findings from this study reveal a predominantly positive perception among nursing students regarding the impact of traditional learning platforms on knowledge acquisition and critical thinking skills development. A majority of respondents reported a high perceived impact, and these results strongly indicate that students continue to value the traditional classroom experience in their nursing education (Hanafy et al., 2021). When examining specific aspects of traditional learning, students particularly acknowledged the effectiveness of traditional classroom teaching in improving their understanding of nursing concepts, with a remarkably high proportion either agreeing or strongly agreeing with this statement (Challa et al., 2021).

This finding aligns closely with previous studies in Nigeria, which identified potential for enhancing critical thinking through traditional classroom learning, though those studies emphasized the importance of quality instructional materials a factor not explicitly addressed in the current study (Abazie & Odikpo, 2024). The value of interactive elements within traditional learning environments is evident in the current findings, with a majority of respondents affirming that face-to-face lectures facilitate question-asking and topic clarification (Bam et al., 2021). This corresponds with research highlighting the effectiveness of classroom debates in developing critical thinking and communication skills among nursing students (Xu et al., 2023). Similarly, the current finding that most students believe group discussions strengthen critical thinking

abilities mirrors conclusions on Team-Based Learning's positive effects on nursing students' cognitive development in traditional classroom settings (Issa & Khataibeh, 2021).

The current study also revealed that students feel traditional classroom settings motivate active participation in learning (Jones et al., 2024). This contrasts somewhat with systematic reviews which found that flipped classrooms generated greater satisfaction and reduced boredom compared to traditional environments (Yulian, 2021). However, the high motivation reported in our study suggests that traditional classrooms may still effectively engage students when properly implemented (Challa et al., 2021). An interesting point of comparison appears in the assessment of teachers' effectiveness in stimulating analytical thinking, where a moderate proportion of respondents agreed with this statement representing the lowest agreement rate among all traditional learning aspects surveyed (Kantek & Yıldırım, 2020).

This more moderate response aligns with findings that traditional classrooms can potentially hinder critical thinking development unless educators apply interactive and reflective pedagogies (Hursen, 2021). The respondents' relatively positive perception about traditional learning promoting better knowledge retention contrasts with some previous research (Rossi et al., 2021). For instance, previous studies found that traditional nursing curricula needed explicit critical thinking instruction to significantly enhance cognitive skill development, suggesting that traditional approaches alone might not be sufficient (Bayram et al., 2022). Physical classroom interaction was valued by a majority of students for enhancing peer learning and idea exchange, supporting findings about the benefits of integrating traditional approaches with practical experiences (Bam et al., 2021). The conducive environment for critical discussions that traditional classrooms offer was recognized by most respondents, reinforcing the notion from

previous studies that traditional settings can foster deeper analytical thinking when structured appropriately (Xu et al., 2023).

Overall, while our findings largely support the continued relevance and effectiveness of traditional learning platforms in nursing education, they also suggest areas for potential enhancement, particularly in teaching strategies that stimulate analytical thinking (Evgın & Sümen, 2023). These results must be considered alongside findings about online learning platforms to develop a comprehensive understanding of optimal educational approaches for nursing students' knowledge acquisition and critical thinking development (Naciri et al., 2021).

5.1.1 Traditional Learning Platforms' Impact on Knowledge and Critical Thinking Skills

The current study reveals that a substantial majority of nursing students perceive traditional learning platforms as having a high impact on knowledge acquisition and critical thinking development (Hanafy et al., 2021). This finding underscores the continued relevance of traditional classroom instruction in nursing education, despite the increasing integration of digital learning environments (Keržič et al., 2021). Examining the specific elements of traditional learning, the data shows overwhelmingly positive perceptions regarding the improvement of nursing concept understanding, with nearly all respondents either agreeing or strongly agreeing with this statement (Challa et al., 2021). This finding aligns with studies in Nigeria which identified the potential of traditional classroom environments for enhancing critical thinking, though those studies emphasized that success depends heavily on the quality of instructional materials—a variable not directly assessed in our study (Abazie & Odikpo, 2024).

The value of face-to-face interaction emerges clearly in our findings, with a majority of students affirming that traditional lectures facilitate question-asking and topic clarification (Bam et al., 2021). This mirrors research on classroom debates which demonstrated that interactive traditional strategies enhance both critical thinking and communication skills (Xu et al., 2023). Our finding that most respondents believe traditional lectures enhance critical thinking skills further supports this connection, suggesting that direct instructor-student engagement remains highly valued for cognitive development (Kantek & Yıldırım, 2020). Real-time feedback, a distinctive feature of traditional learning environments, was rated positively by a majority of students for improving academic performance (Jones et al., 2024). This finding resonates with research on Team-Based Learning in traditional settings, which found that immediate feedback during interactive classroom activities significantly enhanced student engagement and, consequently, critical thinking dispositions (Issa & Khataibeh, 2021).

The strong appreciation for traditional classroom settings motivating active participation presents an interesting contrast to systematic review findings (Yulian, 2021). While previous studies concluded that flipped classrooms generated greater satisfaction and reduced boredom compared to traditional environments (Samiei & Ebadi, 2021), our results suggest that well-implemented traditional classrooms may still effectively engage nursing students (Challa et al., 2021). This discrepancy highlights the potential variability in how traditional instruction is delivered across different educational contexts (Fatima et al., 2022). However, some aspects of traditional learning received more moderate support (Rossi et al., 2021). The statement that traditional learning promotes better knowledge retention received moderate agreement, with a notable proportion of students disagreeing (Bayram et al., 2022). This suggests some limitations in traditional approaches for knowledge retention, echoing findings that traditional nursing

curricula required explicit critical thinking instruction to significantly enhance cognitive skills (Hursen, 2021).

Similarly, teachers' effectiveness in stimulating analytical thinking in traditional settings received the lowest agreement rate (Kantek & Yıldırım, 2020). This finding aligns with observations that traditional classrooms can potentially hinder critical thinking development unless educators implement interactive and reflective teaching strategies (Evgın & Sümen, 2023). The relatively lower scores in these areas signal opportunities for enhancing traditional teaching approaches to better foster higher-order thinking skills (Xu et al., 2023). The physical dimension of traditional learning environments was valued by a majority of students for enhancing peer learning and idea exchange (Bam et al., 2021). This supports research on the benefits of integrating classroom instruction with experiential learning (Yılmaz et al., 2020). Additionally, most respondents agreed that traditional classrooms offer a conducive environment for critical discussions, reinforcing the notion that physical learning spaces can foster deeper analytical thinking when properly structured (Issa & Khataibeh, 2021).

These findings present a nuanced view of traditional learning platforms, indicating that while they are generally perceived positively for their impact on knowledge and critical thinking development, certain aspects may require enhancement to maximize educational outcomes (Naciri et al., 2021). The results affirm the continued importance of traditional classroom instruction in nursing education while suggesting specific areas particularly related to knowledge retention and analytical thinking stimulation where pedagogical approaches might be refined to better support students' cognitive development (Evgın & Sümen, 2023).

5.1.2 Perceived Impact of Online Learning Platforms on Knowledge and Critical Thinking Skills

The present study revealed a significant positive perception among nursing students regarding the impact of online learning platforms on knowledge acquisition and critical thinking development (Keržič et al., 2021). A substantial majority of respondents reported a high perceived impact of online learning on these critical educational outcomes, while a smaller proportion indicated a low perceived impact (Jiang et al., 2021). This finding suggests that nursing students generally view online learning as beneficial for their cognitive development (Almulla & Al-Rahmi, 2023). Analysis of specific aspects of online learning platforms reveals consistently positive responses across all measured variables (Weheida et al., 2021). Students particularly valued the ability to revisit recorded lectures and the use of multimedia tools which they believed significantly enhanced their understanding of complex nursing concepts (Firdaus et al., 2022). Additionally, students reported that online learning improved their ability to study independently and provided flexibility that enhanced accessibility to diverse educational resources (Balogun et al., 2023).

These findings align with several studies in the empirical review (Enyoojo et al., 2024). Research similarly found that university students in South Africa demonstrated strong preference for e-learning resources and acknowledged their positive influence on cognitive and analytical abilities (Meirbekov et al., 2022). Similarly, descriptive cross-sectional surveys reported that a majority of medical students strongly agreed that online learning effectively delivered course content, supporting our finding of high perceived effectiveness among nursing students (Kim, 2024). The current study's results regarding the positive impact of online platforms on critical thinking also

complement meta-analyses which demonstrated that non-traditional teaching methods, including online approaches incorporating concept mapping and reflective writing, significantly enhanced critical thinking abilities among nursing students (Xu et al., 2023).

However, these findings present an interesting contrast with some aspects of previous research (Ogolodom et al., 2023). While previous studies found that nursing and radiography students faced challenges including financial constraints, lack of internet access, and inadequate technical skills (Cengïz et al., 2021), our study indicates that these barriers did not significantly diminish students' overall positive perception of online learning's impact on their knowledge and critical thinking development (Nurakhir Oducado & Estoque, 2021). This suggests that perceived educational benefits may outweigh technological and accessibility challenges (Balogun et al., 2023). The present study also diverges somewhat from research which highlighted significant stress levels among gerontological nursing students linked to online learning, particularly feelings of isolation (Ali et al., 2022). While our findings show high agreement with statements about self-directed learning and independent study, they do not directly address the emotional and psychological aspects of online learning that previous studies emphasized as limitations (Majrashi et al., 2021).

In contrast to studies which found traditional classroom learning effective for critical thinking but limited by the quality of instructional materials (Abazie & Odikpo, 2024), our research suggests that online platforms provide robust support for critical thinking through discussion forums, self-directed learning, and internet-based simulations (Montague et al., 2024). This indicates that properly designed online learning environments may address some limitations identified in traditional settings (Langegård et al., 2021). The findings align with conclusions that while e-

learning was successful during the pandemic, a blended learning model would be optimal for future implementation (McCutcheon et al., 2018). Our positive responses across different aspects of online learning support the potential value of incorporating these platforms into nursing education, while not necessarily replacing traditional methods entirely (Naciri et al., 2021).

Overall, these findings suggest that nursing students perceive substantial benefits from online learning platforms for both knowledge acquisition and critical thinking development (Keržič et al., 2021). The consistently positive responses across multiple dimensions indicate that features such as accessibility, flexibility, multimedia tools, and self-paced learning are particularly valued (Enyoojo et al., 2024). These results support the integration of online learning platforms into nursing education while acknowledging the potential complementary role of traditional classroom methods in a comprehensive educational approach (Adesuyi et al., 2023).

5.1.3 Strengths and Limitations of Traditional and Online Learning Platforms

The findings regarding the strengths and limitations of traditional and online learning platforms reveal nuanced perspectives among nursing students, with a majority of respondents perceiving high levels of strength in both learning modalities while a smaller proportion indicated low levels (Keržič et al., 2021). This suggests that most students recognize valuable attributes in both educational approaches (Monteiro & Vati, 2022). When examining specific elements, the results demonstrate that students strongly acknowledge the complementary nature of both learning environments (McCutcheon et al., 2018). The strongest agreement was associated with poor internet connectivity disrupting online learning effectiveness, echoing findings which identified technical challenges including internet bandwidth limitations as significant barriers to successful online education in Nigerian and Sudanese contexts respectively (Ogolodom et al., 2023).

Students strongly agreed that online learning offers greater flexibility in learning schedules and provides access to a wider range of educational resources compared to traditional classrooms (Balogun et al., 2023). This aligns with studies which highlighted students' strong preference for e-learning resources and their positive influence on cognitive and analytical abilities (Meirbekov et al., 2022). Similarly, previous research found high usage and positive perceptions of e-learning systems among university students (Jiang et al., 2021).

Regarding traditional learning, respondents affirmed that traditional classroom settings allow for more hands-on practical experiences than online learning (Yılmaz et al., 2020). This finding corresponds with studies which demonstrated that blending classroom instruction with practical clinical experiences positively influences students' critical reasoning (Bam et al., 2021). The current study also confirmed that traditional learning environments are more structured and supervised and more effective for building communication and interpersonal skills, supporting research which found that traditional instructional methods like classroom debates enhanced students' critical thinking and communication skills (Xu et al., 2023). However, while respondents agreed that traditional classroom learning provides better real-time feedback than online learning and encourages more effective critical thinking discussions, these scores were comparatively lower than other traditional learning attributes (Jones et al., 2024). This presents an interesting contrast with findings which emphasized teachers' perception of a strong connection between critical thinking development and traditional instruction, though noting that effectiveness was limited by instructional material quality (Abazie & Odikpo, 2024).

Respondents acknowledged that online learning demands higher levels of self-discipline and makes it easier to balance studies with personal commitments, though these were among the

lower-rated attributes (Almulla & Al-Rahmi, 2023). This nuanced perspective aligns with studies which identified stress factors associated with online learning, including lack of emotional support and isolation (Ali et al., 2022). Overall, these findings reveal a balanced view that differs somewhat from conclusions that nursing students frequently perceive significant limitations in online learning regarding satisfaction and engagement (Nurakhir Oducado & Estoque, 2021). Instead, the current study suggests students recognize distinct advantages in both modalities, with traditional learning valued for structure, supervision, interpersonal skill development, and hands-on experience, while online learning is appreciated for flexibility, resource accessibility, and accommodating personal commitments (Montague et al., 2024).

These findings support conclusions that both traditional and online approaches have complementary strengths, and optimal educational outcomes may require thoughtfully integrated or blended learning models (Enyoojo et al., 2024), as also recommended by previous research (McCutcheon et al., 2018). This balanced perspective points toward educational approaches that leverage the strengths of both traditional and online platforms while addressing their respective limitations to effectively support nursing students' knowledge acquisition and critical thinking development (Naciri et al., 2021).

5.2 Implications to Nurses

The findings of this study carry important implications for nurses, particularly in the context of education, professional development, and practice. First, the strong positive perception of traditional learning platforms highlights the continued relevance of face-to-face instruction in building foundational knowledge and critical thinking skills. This suggests that nurse educators must maintain and enhance traditional classroom practices, ensuring that they incorporate

interactive and reflective teaching strategies to fully stimulate analytical thinking among students. Simply relying on conventional lecture methods may not be sufficient; instead, fostering active participation, encouraging group discussions, and facilitating real-time feedback will be essential for cultivating deeper cognitive skills. Furthermore, the high perceived impact of online learning platforms underscores the growing importance of digital literacy among nurses. As students increasingly value the flexibility, accessibility, and multimedia tools provided by online learning, nurse educators and practicing nurses must become adept at navigating and utilizing these technologies effectively. This means developing competencies not only in clinical care but also in virtual communication, self-directed learning, and the use of online educational resources. Nurses must be prepared to adapt to blended learning environments, where traditional methods are complemented by digital platforms, ensuring they remain agile learners throughout their careers.

The recognition of both the strengths and limitations of traditional and online learning models also points to the need for nurses to advocate for balanced educational approaches. In clinical practice, where ongoing education is vital, nurses should encourage the integration of structured, supervised training with flexible, technology-enhanced learning opportunities. This dual approach can help bridge gaps in knowledge retention, critical thinking, and practical skill development. Moreover, as healthcare increasingly integrates telemedicine, remote monitoring, and virtual consultations, the ability to learn and operate within online platforms becomes a practical necessity for nurses. The study's findings emphasize that comfort with online learning environments may translate into greater confidence and effectiveness in these emerging areas of nursing practice.

Finally, the study suggests that nurses, both as learners and educators, must remain mindful of potential challenges associated with each learning modality. For instance, while online learning offers flexibility, it requires high levels of self-discipline and can sometimes lead to feelings of isolation. Conversely, traditional learning environments, if not carefully designed, might fail to adequately stimulate critical thinking. Nurses must, therefore, strive for continuous self-improvement, seek supportive learning communities, and advocate for educational strategies that foster both professional competence and personal growth.

5.3 Summary

This study explored nursing students' perceptions of traditional and online learning platforms regarding knowledge acquisition and critical thinking development. The findings revealed that a significant majority (75%) viewed traditional classroom learning positively, especially for improving understanding of nursing concepts, encouraging active participation, and facilitating peer interaction. However, some limitations were noted, particularly in promoting higher-order analytical thinking without interactive teaching strategies. Similarly, online learning platforms were highly valued, with 78% of students reporting a positive impact. Features such as flexibility, access to multimedia resources, recorded lectures, and self-directed study were seen as major advantages, though challenges like internet connectivity and the need for strong self-discipline were acknowledged. The study also highlighted that both traditional and online learning environments offer complementary strengths. Traditional learning was praised for hands-on experiences, real-time feedback, and structured supervision, while online learning offered greater flexibility, resource accessibility, and opportunities for independent study. Overall, the findings suggest that integrating both traditional and online learning methods—through a blended

approach would be most effective for supporting nursing students' knowledge acquisition, critical thinking development, and preparation for the dynamic demands of modern nursing practice

5.4 Conclusion

This study concludes that both traditional and online learning platforms play significant roles in enhancing nursing students' knowledge acquisition and critical thinking skills. While traditional classroom environments remain highly valued for their structure, real-time feedback, peer interaction, and practical experience, online platforms are equally appreciated for their flexibility, accessibility, and ability to promote independent learning. The findings highlight that no single method is entirely sufficient on its own; rather, a balanced, blended approach that integrates the strengths of both traditional and online learning is essential to meet the diverse educational needs of nursing students. Moreover, the results emphasize the need for continuous improvement in teaching strategies, particularly within traditional settings, to better stimulate analytical thinking and knowledge retention. Nurse educators and institutions must therefore adapt by combining interactive, reflective classroom activities with the technological advantages offered by digital learning. By doing so, they can create a more dynamic, engaging, and effective educational experience that prepares future nurses to excel in an evolving healthcare landscape.

5.5 Limitations of the Study

While this study provides valuable insights into nursing students' perceptions of traditional and online learning platforms, several limitations should be acknowledged. First, the study relied on self-reported data collected through questionnaires, which may be subject to response biases such as social desirability or recall inaccuracies. Students may have provided answers they believed

were expected rather than reflecting their true experiences. Second, the sample was limited to nursing students from a specific region or institution, which may restrict the generalizability of the findings to broader populations or other educational contexts. Differences in curriculum design, technological infrastructure, and teaching methods across institutions could influence perceptions and outcomes differently. Third, although the study compared perceptions of traditional and online learning, it did not account for variations in the quality of online course delivery or the experience levels of instructors with digital teaching tools, both of which could significantly affect students' learning experiences. These limitations suggest that future research should use more diverse samples, incorporate qualitative methods such as interviews or focus groups, and explore additional factors influencing learning perceptions to provide a more comprehensive and nuanced understanding.

5.6 Recommendations

Based on the findings and limitations of this study, the following recommendations are proposed:

1. Blended Learning Approach: Nursing education programs should consider adopting a blended learning model that integrates the strengths of both traditional and online platforms. This would allow students to benefit from the structured, interactive nature of classroom learning while also enjoying the flexibility and resource richness of online education.
2. Enhancing Teaching Strategies: Educators should be trained and encouraged to apply more interactive and reflective teaching methods within traditional classrooms to better stimulate analytical thinking and critical reasoning among nursing students.

3. Improvement of Online Learning Infrastructure: Institutions should invest in improving the technological infrastructure needed to support effective online learning, including providing reliable internet access, user-friendly learning platforms, and technical support services for both students and faculty.
4. Focus on Emotional and Psychological Support: Future educational strategies should incorporate measures to address the emotional well-being of students engaged in online learning, helping to reduce feelings of isolation and stress through virtual peer support groups, mentoring, and regular interactive sessions.
5. Continuous Professional Development for Educators: Faculty development programs should include training on both traditional and digital teaching methodologies to ensure educators can deliver content effectively across different platforms and adapt to evolving educational needs.
6. Further Research: Future studies should involve larger, more diverse student populations across different institutions and geographic regions. Incorporating qualitative methods such as interviews and focus group discussions could provide deeper insights into students' experiences, challenges, and preferences regarding both traditional and online learning.

5.7 Suggestions for Further Study

1. Comparative Studies Across Institutions: Future research should compare the perceptions of nursing students from multiple institutions and regions to identify possible differences based on geographic, cultural, or institutional factors.

2. Longitudinal Studies: Conducting longitudinal studies could provide deeper insights into how students' perceptions of traditional and online learning platforms evolve over time and how these perceptions impact long-term academic and professional outcomes.

3. Qualitative Research: In-depth qualitative studies, such as interviews and focus groups, are recommended to explore students' personal experiences, emotional responses, and coping strategies in both traditional and online learning environments.

4. Impact of Teaching Styles: Further studies could investigate the role of different teaching styles and instructional strategies within traditional and online platforms, examining how specific methods influence critical thinking, knowledge retention, and overall student satisfaction.

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APPENDIX I

FACULTY OF NURSING SCIENCE

UNIVERSITY OF BENIN

BENIN CITY

Dear Respondent,

I am a 500-level student of the Department of Nursing Science in the above-named institution. I am conducting a research study titled: “Perceived Impact Of Traditional And Online Learning

Platforms On Nursing Student's Knowledge And Critical Thinking Skills In A Tertiary Institution In Benin City "Your responses will be treated with the utmost confidentiality and used solely for academic purposes.

Thank you for your valuable time and cooperation.

Yours faithfully,

Otobore Success

Instruction: please do not write your name, provide and tick the appropriate answer.

SECTION A: Socio-Demographic Data;

INSTRUCTIONS: Tick ☑ the most applicable answer to you.

1. Age: ( ) 16 – 20 ( ) 21 – 25 ( ) 26 – 30 ( ) Above 30
2. Gender:( ) Male ( ) Female ( )
3. Marital Status:( ) Single ( ) Married
4. Level of Study: ( ) 200 Level ( ) 300 Level ( ) 400 Level ( ) 500 Level
5. Religion:( ) Christianity ( ) Islam ( ) African Traditional Religion ( ) Other
6. Ethnic Group:( ) Igbo ( ) Yoruba ( ) Hausa ( ) Bini ( ) Other
7. Place of Residence: ( ) On campus ( ) Off campus
8. How long have you been enrolled in your nursing program? ( ) Less than 1 year ( ) 1 – 2

SECTION B: This section asks questions on your perception of the impact of Traditional learning platforms on knowledge and critical thinking skills. Choose the most appropriate
Strongly agree= 4, Agree= 3, Disagree= 2, Strongly disagree= 1

Variables	4	3	2	1
Traditional classroom teaching improves my understanding of nursing concepts.				
Face-to-face lectures allow me to ask questions and clarify difficult topics.				
Traditional lectures help to enhance my critical thinking skills.				
Real-time feedback during classes improves my academic performance.				
Group discussions in traditional classrooms strengthen my ability to think critically.				
Traditional classroom settings motivate me to actively participate in learning.				
The structure of traditional learning promotes better retention of knowledge.				
Teachers in traditional settings effectively stimulate analytical thinking.				
Physical classroom interaction enhances peer learning and idea exchange.				
Traditional classroom learning offers a conducive environment for critical discussions.				

SECTION C: This section asks questions on your perception of the impact of Online Learning Platforms on Knowledge and Critical Thinking Skills. Choose the most appropriate response.

Strongly Agree = 4, Agree = 3, Disagree = 2, Strongly Disagree = 1

Variables	4	3	2	1
Online learning platforms make it easy to access diverse educational resources.				
Flexibility in online learning helps improve my study habits.				
Online classes allow me to revisit recorded lectures to strengthen my knowledge.				
The use of multimedia tools in online platforms improves my understanding of concepts.				
Online learning has enhanced my ability to study independently.				

Online discussion forums encourage critical thinking among students.				
Online quizzes and assignments enhance my knowledge retention.				
Online platforms promote self-directed learning that strengthens critical analysis skills.				
Internet-based simulations and case studies help develop critical thinking.				
Online classes allow me to pace my learning for better comprehension.				

SECTION D: This section asks questions strengths and limitations of both traditional and online learning. Choose the most appropriate response.

Strongly Agree = 4, Agree = 3, Disagree = 2, Strongly Disagree = 1

Variables	4	3	2	1
Traditional classroom learning provides better real-time feedback than online learning.				
Online learning offers greater flexibility in learning schedules compared to traditional classrooms.				

Poor internet connectivity often disrupts the effectiveness of online learning.				
Traditional classroom environments encourage more effective critical thinking discussions than online platforms.				
Online learning platforms provide access to a wider range of educational resources.				
Traditional classroom settings allow for more hands-on practical experiences than online learning.				
Online learning demands higher levels of self-discipline compared to traditional learning.				
Traditional learning environments are more structured and supervised than online platforms.				
Online platforms make it easier to balance studies with personal commitments compared to traditional learning.				
Traditional learning methods are more effective for building communication and interpersonal skills than online learning.				

APPENDIX II

RELIABILITY ANALYSIS RESULTS

Scale1: perception of the impact of Traditional learning platforms on knowledge and critical thinking skills

Case Processing Summary

		N	%
Cases	Valid	242	100.0
	Excluded[a]	0	.0
	Total	242	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.938	.938	12

Scale2: perception of the impact of Online Learning Platforms on Knowledge and Critical Thinking Skills

Case Processing Summary

		N	%
Cases	Valid	242	100.0
	Excluded[a]	0	.0
	Total	242	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.816	.820	6

Scale 3: strengths and limitations of both traditional and online learning.

Case Processing Summary

		N	%
Cases	Valid	242	100.0

	Excluded[a]	0	.0
	Total	242	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.500	.648	9