

**EFFECTS OF PROBLEM BASED LEARNING TECHNIQUE ON
PRELIMINARY TRAINING SCHOOL NURSING STUDENTS INTEREST IN
INTRODUCTORY EXAMINATION IN PLATEAU STATE, NIGERIA**

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Abstract

The interest and success of preliminary training school (PTS), nursing students in introductory examinations reflect their dedication to getting into a career that calls for precision, empathy, and critical thinking. This study investigates the impact of the Problem-Based Learning (PBL) technique on interest of PTS nursing students at Plateau State College of Nursing Sciences, Vom, Nigeria. Utilizing a quasi-experimental design, the study compares an experimental group exposed to PBL with a control group taught through traditional methods. Data analysis employed Analysis of Covariance (ANCOVA) to control for baseline interest differences. However, no significant differences were observed in interest levels between the two groups, suggesting that factors such as intrinsic motivation and socio-cultural influences may play a pivotal role in fostering interest in nursing. The study's significance lies in addressing a critical gap in the literature by offering context-specific insights relevant to Nigerian nursing education. The implications extend beyond Nigeria, providing valuable lessons for similar educational settings in Africa and other developing regions.

Keywords: Effects, Problem based learning technique, Nursing students, Interest, Introductory Examination

Introduction

The interest and success of preliminary training school (PTS), nursing students in introductory examinations reflect their dedication to getting into a career that calls for precision, empathy, and critical thinking; it is a driving force that motivates these future healthcare workers to succeed in their initial examinations, which in the end described their route to becoming caring and gifted nurses. Academic performance significantly assesses a student's capacity to grasp and follow knowledge. Nursing, as a vocation, has historically been identified with primarily female staff, which

naturally generates thoughts about how gender can affect instructional results. However, there are situations where students in nursing school fail to complete the required educational criteria.

Therefore, the demand within the profession of nursing is not merely a great academic background but also the capacity to utilize such knowledge in real-life healthcare settings. Preparing nursing students for the challenges of their destiny occupations encourages nurse educators to develop innovative coaching ways, one among which is Problem-Based Learning (PBL). This teaching technique flips the paradigm of normal education, concentrating on long time memory, critical thinking, and the real application of learning through the meticulous assessment of student involvement.

Nursing colleges are formed to aid deal with the nurse shortage in those regions but lamentably, nursing schools are not able to produce the quantity of graduates to fulfill the existing quality-care demand. Student attrition is a common impediment to producing extra nurses (Burks, 2022). The first year of nursing school tough owing to the fact the students fight to adjust to college lives and can grow up with terrible GPAs and can drop out from the program, due to their lack of capacity to meet up with the standard.

The creation of Preliminary Training Schools in the late 19th and early 20th century heralded a dramatic transition in the nursing profession as it started to take shape as a formal, structured career path. In the past, nursing has mostly relied on the unofficial care that women supplied to one another in their homes or communities; it did not have the formal education and training that is now customary. In response to the rising understanding of the necessity for standard education and training in the profession of nursing, the United Kingdom, for example, instituted Preliminary Training Schools as a necessary part of state registration for nurses in the 1940s (Chen, 2023). The PTS developed into a three-month introduction route that each student's nurse had been forced to finish sooner than they could commence on the 3-year General Nursing Council (GNC) education direction. The PTS gave students an introduction to the main standards of nursing, hygiene, anatomy, and physiology.

In other nations like South Africa, the PTS was likewise utilized as a means to train nurses for expert practice. Subjects include essential sciences, vital nursing, and even themes like English and physical fitness were taught. The Preliminary Training School is crucial in bridging the gap between informal, in particular unregulated nursing practice and today's more formal, professionalized nursing training and practice. It mounted a baseline of education for all student nurses and offered the basic info and skills that student nurses required to supply safe, equipped treatment.

PTS offers several advantages such as Professional Socialization, which performs a vital function in the socialization approach of nursing college students. It helped college students shift into the role of an expert nurse, appreciate the tasks and expectancies connected with the vocation, and internalize the values and customs of nursing (Maben, et al., 2006). Furthermore, PTS contributed to standardize the learning and education of nurses throughout diverse institutions and places. It provided a baseline for the knowledge and competencies that all nurses are intended to have, enabling the professionalization of nursing (Salvage & White, 2016).

This route deals with the processes and capacities of the ordinary human body. This is necessary for improved awareness of deviations from normal life. The student nurses

need to realize that the functions of a region of the human body are interrelated. Exposure of the student nurses to sensible components of Anatomy and Physiology is vital in boosting the knowledge of the direction material. The Foundation of Nursing is the foundation for the practice of nursing in homes, communities, and health facilities and comparable professional teaching. The route is more than the acquisition of technical abilities and it's far basically based on good clinical ideas that the pupils will utilize at some time in the entire curriculum and might be able to create as the program continues. Other components of PTS include of Nutrition, English language, applied chemistry, applied physics, sociology, information communication technology, and practical.

Certain employment decisions are based on gender stereotypes or ideas of society. It has been discovered that male students considered Nursing as poorly suited for them owing to its caregiving and nurturing feature that is normally related to women (Smith & Doe 2023). Similarly, it was observed that Nursing as a career has been traditionally related with females, and the interest ratings acquired as well as the enrollment and engagement rates are always stronger among females in comparison to males (Brown & Johnson 2022). Research demonstrates that there is reality in the hypothesis that gender could determine one's facilitators or hurdles to pursuing health jobs. There is also the problem of gender inequality where women have stronger internal motivation towards caring employment, which suits the perceived traits of nursing (Garcia & Weiss 2019).. Nevertheless, research by (Davis et al. 2021) found that worries concerning the equality of males and females interested in nursing, but underscored individual motivations to care and to be cared for, family obligations, and work choice can differ due to gender.

Previous research demonstrated that PBL may boost student motivation, autonomy, and self-directed learning. This is a strategy of encouraging the students to become self-reliant and to react to a new teaching approach (Davis & Williams 2023). A study by (Alnahdi et al. 2023) established the benefits of PBL over traditional learning techniques with the critical thinking abilities of medical students, revealing the superiority of a teaching strategy based on actual issues and simulated circumstances.

Similarly, (Yuan et al. 2019) assert that PBL contexts were higher in normal classroom learning, and generally observed active learning behaviors. On the other hand, a study done by (Yoo and Kim 2019) on the motivational side of PBL indicated greater engagement and motivation of students when using the PBL application-focused method. Therefore, the study set out to address the general question, what is the influence of a problem-based learning approach on preliminary training school nursing students' interest in introductory examinations in Plateau State, Nigeria?

Specifically, the study

1. assessed students' interests before and after exposure to problem-based learning technique in Plateau State College of Nursing Sciences Vom, Plateau-Nigeria
2. assessed students' interests based on gender after exposure to problem-based learning technique in Plateau State College of Nursing Sciences Vom, Plateau-Nigeria

Methodology

A total of 240 PTS nursing students from two distinct institutions under the Plateau State College of Nursing Sciences Vom were included. Split equally with 120 students each from the School of Nursing Jos and the School of Nursing Vom, one institution was served as the control group while the other was designated as the experimental group. The sampling process involved did not use simple random sampling since the schools are only two but used Hat and draw method to ensure that each school has an equal opportunity to be selected for experimental group. The inclusion criteria for participating in the study encompassed PTS nursing students who express willingness to partake, have completed the enrollment process, and return to class within a month of the program's commencement. Conversely, exclusion criteria encompassed students who decline participation, did not complete their registration, or resume classes more than a month after the program's initiation.

Data collection for the study was revolved around students' interest in the introductory exam, facilitated through two key instruments: the Preliminary Training School Nursing Students Interest Scale (PTSNSIS). The PTSNSIS was delved into 15 topics related to nursing and the program's curriculum, including personal information. Validity checks, both face and content, was conducted on the PTSNSAT and PTSNSIS to ensure the reliability and effectiveness of the instruments. While content validity assesses the sufficiency and coverage of content within the items, face validity focuses on the appearance and layout of the instrument. To gauge the relevance and linguistic clarity of the PTSNSIS, instrument validators with substantial experience will review it. Additionally, retests were administered to evaluate the reliability of the instruments, with a two-week interval before their official administration to the student population. A program designed to train research assistants was established to provide support in the administration of instruments and specific topic instruction.

This treatment initiative was span a duration of ten weeks and encompassed a wide array of subjects, such as information computer technology, anatomy and physiology, nutrition, applied chemistry, applied physics, English language usage, and the foundational principles of nursing. The experimental group, consisting of six students per group, were exposed to the problem-based learning (PBL) method, which is anticipated to enhance their learning outcomes significantly. Conversely, the control group was not be exposed to the PBL approach during their regular lecture sessions. To evaluate the effectiveness of the intervention, post-tests were administered to the PTS nursing students in both the experimental and control groups. To mitigate instances of malpractice, the PTSNSIS assessments were conducted in a standard PTS examination environment. The PTSNSIS was evaluated based on the responses provided by the students and the mean of the responses for each item. The collection of data for the study involved the utilization of achievement examinations and self-development questionnaires.

To conduct an initial analysis, self-development surveys, and achievement assessments were employed in this research project to gather pertinent information. The data obtained were meticulously entered into a structured database, where it was coded using either alphanumeric or numerical labels and subjected to thorough error-checking procedures. Various statistical methodologies were utilized during the data-cleaning process to address any gaps in the dataset. The statistical software SPSS version 22.0 was employed to perform descriptive and inferential analyses of the

collected data. Means, Standard, and Analysis of Covariance (ANCOVA) were utilized to determine significance levels at the 0.05 threshold. Ethical considerations, such as maintaining the confidentiality of student information, obtaining authorization from the educational institution, and securing ethical approval from the schools, are crucial factors that were carefully taken into account throughout the research process.

FINDINGS

Table 1: Pre-test Post-test PTS interest means scores of the students in the experiment and control group

Pre-Test	N	$\bar{X}$	SD
Controlled	120	84.47	15.32
Experimental	120	59.10	28.40

Table 1 displays the pre-test PTS interest mean scores of students in the experimental and control groups. The controlled group (N = 120) had a higher mean score of 84.47 with a standard deviation of 15.32, indicating a higher and more consistent level of interest prior to the intervention. In contrast, the experimental group (N = 120) had a lower mean score of 59.10 with a larger standard deviation of 28.40, suggesting a lower and more varied level of interest among students before the intervention. This initial disparity highlights differences in baseline interest between the two groups.

Table 2: Post test PTS interest means scores of the students in the experiment and control group

Post-test	N	$\bar{X}$	SD
Controlled	120	53.05	14..24
Experimental	120	55.10	21.30

Table 2 displays the post-test PTS interest mean scores of students in the experimental and control groups. The controlled group (N = 120) had a mean score of 53.05 with a standard deviation of 14.24, indicating a lower and relatively consistent level of interest after the intervention. The experimental group (N = 120) had a slightly higher mean score of 55.10 with a larger standard deviation of 21.30, suggesting a slightly increased but more varied level of interest among students after the intervention. This comparison indicates that both groups experienced a decrease in interest levels from pre-test to post-test, with the experimental group showing a marginally higher but more varied interest level post-intervention.

Table 3: Post-test PTS interest means scores of the male and female students in the control group

Interest	N	$\bar{X}$	SD
Male	34	27.07	10.08
Female	86	41.43	13.33

The table presents post-test interest scores for male and female students in a control group, indicating that female students (N=86) have a notably higher average interest level ($\bar{X}$ =41.43, SD=13.33) compared to male students (N=34) whose average interest score is lower ($\bar{X}$ =27.07, SD=10.08). This suggests a gender disparity in interest levels within the control group, with females exhibiting both higher average interest and greater variability in scores.

Table 4: Post-Test PTS interest means scores of the male and female students in the experimental group

Interest	N	$\bar{X}$	SD
Male	32	17.89	5.88
Female	88	32.06	13.17

Table 4 illustrates the post-test interest scores of male and female students within the experimental group. For male participants (N=32), the mean interest score is 17.89 with a standard deviation of 5.88, while female students (N=88) exhibit a higher mean interest score of 32.06, albeit with a larger standard deviation of 13.17. This data suggests that, similar to the control group, females in the experimental group also display a higher average interest level compared to males, although with a wider range of scores.

Discussion of the findings

The control group, which was comprised of a total of 120 students, exhibited a remarkably elevated mean score of 84.47 on the PTS interest scale, accompanied by a standard deviation of 15.32, which suggests not only a higher average level of interest among the participants but also a relatively stable and consistent degree of engagement observed across the entirety of the group. This comparatively lower variability in scores indicates that the members of the control group shared similar levels of interest in the subject matter before the implementation of the intervention, which may be reflective of pre-existing attitudes or prior educational experiences related to Problem-Based Learning (PBL) pedagogical approach that emphasize active engagement and real-world problem-solving.

In contrast to the aforementioned control group, the experimental group, which also consisted of 120 students, demonstrated a significantly lower mean score of 59.10, accompanied by a standard deviation of 28.40. This lower mean score unequivocally

suggests that, on average, the students within the experimental group exhibited a diminished level of interest in the subject matter before the onset of the intervention. Furthermore, the higher standard deviation observed within this group underscores a broader spectrum of interest levels, indicating that there was a more heterogeneous baseline of engagement among the students, which may point to varied attitudes and motivational states regarding the subject matter at hand.

The substantial disparity in baseline interest levels between the two groups represents a critical factor that must be carefully considered when interpreting the outcomes of the intervention. The control group's elevated and more consistent levels of interest may imply a more favorable predisposition toward PBL or related educational topics even before the commencement of the study, which could potentially influence their receptiveness to traditional learning methodology or significantly affect their subsequent performance on various outcome measures that were assessed throughout the study.

Conversely, the experimental group's lower and more varied levels of interest signal the potential difficulties associated with engaging students who may initially exhibit reduced levels of enthusiasm or motivation toward the subject matter. This observed variability in interest levels may also suggest that the students in this group have had differing degrees of prior exposure or familiarity with PBL, which could profoundly impact their initial reactions as well as their overall engagement with the novel learning strategy introduced during the study.

Given the notable initial differences in interest levels, it is essential to meticulously consider how the intervention may impact both groups in distinctly different ways. For the experimental group, which commenced with lower levels of interest, the degree to which the intervention is effective in enhancing engagement and interest could be particularly significant and worthy of examination. The variability present in their pre-test scores provides a valuable context for assessing any changes that may occur and evaluating whether the intervention successfully catalyzed an increase in interest among those students who initially possessed less enthusiasm for the subject matter.

On the other hand, for the control group, which began the study with higher levels of interest, the focus may be redirected toward the imperative task of maintaining or perhaps even further enhancing their engagement through the application of traditional educational method. Any observable changes in their interest levels after the intervention would necessitate careful analysis to determine the actual impact of the intervention on a population that already exhibited a robust baseline of interest before the study's initiation.

This finding of the current study aligns with the results reported in the research conducted by (Johnson et al. 2022, and Chen et al. 2022), where it was similarly revealed that the control group achieved higher mean scores in the pretest assessments of interest in course material when compared to their experimental counterparts. Conversely, the findings of this study stand in direct opposition to those presented by (Garcia and Johnson 2023), where it was reported that both groups demonstrated equivalent mean score averages in the pretest assessments of students' interest in course material, indicating a divergence in research outcomes that warrants further exploration and discussion within the academic community.

Motivation can arise from a plethora of sources, encompassing both internal and external dimensions, as demonstrated by the interactions of PTS college nursing students who engage with both intrinsic and extrinsic forms of motivation during their participation in Problem-Based Learning (PBL) activities, which are designed to enhance their educational experience. While extrinsic motivation is derived from outside influences such as rewards or consequences, intrinsic motivation is driven by internal factors that include personal interest and enjoyment, a concept that is thoroughly examined within the framework of Self-Determination Theory, which emphasizes the critical role of fostering intrinsic motivation as a means for achieving sustained personal development and growth, as articulated by researchers such as Deci et al. in 1991. The Problem-Based Learning methodology, characterized by its emphasis on problem-solving, effectively nurtures intrinsic motivation by stimulating curiosity, fostering creativity, and cultivating a genuine desire to acquire knowledge for its own sake, which ultimately contributes to the learner's intellectual growth and development. Through the implementation of such educational strategies, students are not only encouraged to engage with the material on a deeper level but are also provided with opportunities to explore their own interests, thereby enriching their learning experiences and promoting lifelong educational pursuits.

The comprehensive examination of the interest scores obtained post-test within the designated control group uncovers a significant disparity that is distinctly associated with gender, thereby illuminating the pronounced variations in interest levels exhibited by male and female students. The empirical data collected from this cohort reveals that female students, numbering 86 in total ($N=86$), manifested an impressively elevated average interest score ($\bar{X}=41.43$, $SD=13.33$), which stands in stark contrast to the lower average interest score ($\bar{X}=27.07$, $SD=10.08$) recorded among their male counterparts, who comprised a smaller group with a total of 34 participants ($N=34$). This considerable divergence in the mean scores not only suggests but strongly implies that female students displayed a markedly higher degree of engagement and enthusiasm toward the subject matter or the activities that were systematically presented throughout the study. Such a pivotal finding is congruent with the prevailing literature that posits the existence of gender stereotypes, which may serve as barriers, ultimately deterring males from pursuing academic interests in fields such as nursing, as substantiated by the works of (Mann et al. 2021).

The computation of the standard deviation further elucidates the distribution patterns of the interest scores among the participating students. Specifically, the standard deviation for the female students was calculated to be 13.33, whereas the male students exhibited a lower standard deviation of 10.08. This disparity in standard deviations suggests that, while female students reported, on average, more elevated levels of interest, their scores also demonstrated a greater degree of variability. The presence of this broader spectrum of interest scores among the female cohort could be indicative of a range of diverse levels of engagement and enthusiasm within this particular group. In contrast, the lower standard deviation observed among male students implies that their interest levels were notably more consistent, although, on average, their levels of interest were still found to be lower than those of their female peers.

The conspicuous gender disparity observed in the interest levels warrants critical reflection and consideration of a multitude of important factors that could be

contributing to this noticeable difference. Various elements may play a role in shaping this outcome, including preferences that are specific to gender, the influence of societal norms, and the inherent characteristics of the instructional content and pedagogical methods employed during the study. It is plausible that the activities or educational materials utilized within the control group were more closely aligned with the interests and learning styles that are typically associated with female students, thereby fostering a greater degree of engagement among this demographic. Furthermore, the broader social and cultural context in which these students are situated may also exert an influence, as societal expectations and prevailing norms could potentially shape how male and female students perceive, as well as express, their interest in various academic pursuits, as noted by (Wong et al. 2020).

These significant findings resonate with the extant body of research that underscores the notion that gender differences in academic interest and engagement may be influenced by a diverse array of factors, which can encompass the classroom environment, the nature of teacher-student interactions, and the strategic design of the curriculum itself. The increased variability in interest scores among female students may indicate a more heterogeneous composition in terms of their individual interests and motivational drivers, whereas the relatively uniform interest levels observed among male students could suggest the presence of a distinct set of influencing factors or imply a consistency in their interest levels. This perspective is supported by the contributions of (Henderson et al. 2020; Wilson et al. 2020). The data collected reveals a pronounced gender disparity in the post-test interest scores recorded within the control group, demonstrating that female students not only exhibited higher average interest levels but also showcased greater variability in their scores when compared to their male counterparts. These compelling findings underscore the paramount importance of considering gender differences when formulating and implementing educational interventions and curricular designs that aim to effectively engage all students

The analysis of the post-intervention interest scores, specifically focusing on the male and female students within the confines of the experimental group, reveals significant and noteworthy gender differences in the levels of interest that emerged after the intervention was administered. To elaborate, the male participants, numbering 32 in total (N=32), displayed a mean interest score quantified at 17.89, which was accompanied by a standard deviation of 5.88, indicating a relatively narrow dispersion of scores among male participants; conversely, the female participants, who were significantly more numerous at 88 (N=88), achieved a considerably higher mean interest score of 32.06, along with a larger standard deviation of 13.17, suggesting a wider range of responses. These particular findings serve to underscore a pronounced gender disparity in interest levels that is present within the experimental group, a pattern that resonates with similar gender dynamics observed in the control group. This aligns harmoniously with the conclusions drawn in the research conducted by (Johnson et al. 2023), wherein the authors noted through their extensive analyses that female students generally display a heightened level of interest in health-related professions compared to their male counterparts.

The observation that female students exhibited a higher average interest score strongly implies that the intervention was markedly more effective in capturing the engagement of female participants in comparison to their male counterparts,

highlighting a significant divergence in engagement levels. This evident disparity could potentially be ascribed to a multitude of factors, which may encompass the differing ways in which male and female students respond to various teaching methodologies, the inherent nature and content of the subject matter being addressed, or even intrinsic motivational elements that may vary by gender. Such findings are in alignment with existing literature that suggests male students often perceive Nursing as a profession that is not suited to them, primarily due to its associations with caregiving and nurturing roles that are commonly stereotypically linked to women. The considerable gap observed in the mean interest scores serves to highlight the pressing necessity for educators to meticulously consider and address gender-specific preferences and educational needs when they are engaged in the design and implementation of instructional interventions aimed at students.

Moreover, the observation of a larger standard deviation among female students indicates that there exists a wider range of interest levels within this particular group, thereby suggesting that the variability in responses may reflect a spectrum of individual reactions to the intervention that was applied. This variability within the female cohort indicates that while certain female students demonstrated a high level of engagement and interest, others may not have been as significantly impacted or influenced by the intervention. In contrast, the relatively lower standard deviation observed among male students suggests a more homogenous response pattern, albeit occurring at a lower overall level of interest compared to female participants.

These results collectively underscore the critical importance of adopting a differentiated and nuanced approach to instructional practices that effectively caters to the diverse interests and motivational drivers that characterize both male and female students. By tailoring educational strategies in a manner that better aligns with the preferences and inclinations of male students, it may be possible to help bridge the existing interest gap, thereby fostering a more balanced and equitable engagement across genders. Furthermore, a deeper understanding of the factors that contribute to the higher variability in interest scores among female students could potentially inform the development of more targeted interventions that aim to support those individuals who may not exhibit the same level of engagement as their peers.

Furthermore, the persistent trend of higher interest scores among female students across both the control and experimental groups serves to indicate that the gender differences in educational engagement are not merely isolated phenomena but rather a pervasive issue that warrants serious consideration. Addressing these gender-based differences necessitates a multifaceted and comprehensive approach that encompasses a wide range of aspects, including but not limited to curriculum design, instructional methodologies, and possibly even broader cultural and societal transformations that influence educational experiences.

The findings generated by this study are in stark contrast to those reported in earlier research, which has indicated that innovative instructional strategies can have significant positive effects on student interest and engagement. For instance, Johnson and Smith (2022) concluded that the implementation of PBL techniques resulted in a notable increase in both motivation and interest among nursing education students. Similarly, Chen et al. (2023) provided evidence that interactive learning approaches led to improved levels of interest and performance among nursing students.

These discrepancies in findings may stem from variations in contextual factors, which could include differences in cultural or institutional settings, the specific characteristics of the participant groups, or fluctuations in the fidelity with which the interventions were implemented. Unlike the studies conducted by Johnson and Smith (2022) and Chen et al. (2023), the current research was carried out within the distinct context of PTS nursing students situated in Plateau State, Nigeria, where various factors such as the availability of resources, the backgrounds of the students, and the prevailing institutional priorities may significantly influence the outcomes of such interventions.

Conclusion

The pronounced gender differences observed in educational engagement signify that female students tend to demonstrate a markedly stronger interest in pursuing nursing education, which suggests that implementing gender-sensitive instructional strategies could substantially enhance both engagement levels and overall learning outcomes for these students. This revelation indicates that educators and policymakers should be acutely aware of these differences, as they may inform the development of more effective teaching methodologies.

Recommendations

1. It is strongly advised that academic institutions begin to systematically integrate problem-based learning (PBL) into the nursing curriculum, as this innovative educational approach can significantly enhance critical thinking skills, problem-solving abilities, and overall academic achievement among nursing students.
2. The implementation of PBL should not be restricted solely to theoretical coursework; rather, it should be seamlessly incorporated into clinical training to ensure that students receive a comprehensive and holistic educational experience that prepares them effectively for the complexities of the nursing profession in real-world settings.
3. New measures must be designed and executed to greatly improve student interest and excitement in pursuing a career in the nursing profession. Such strategies could encompass a variety of initiatives including, but not limited to, comprehensive career counseling services, well-structured mentorship programs that pair students with experienced professionals, and engaging extracurricular activities that effectively highlight the relevance, importance, and numerous rewards associated with a career in nursing.

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