



[www.ajbrui.org](http://www.ajbrui.org)

*Afr. J. Biomed. Res. Vol. 26 (January 2023); 73 - 79*

*Research Article*

# **A Comparative Study of the Effects of Problem-based and Traditional Learning Methods on Self-Directed Learning Readiness among Nursing Students in a Research Methodology Course in Two Universities, Southeast Nigeria**

**\*Chikeme P.C.<sup>1</sup>, Ogonnaya N.P.<sup>1</sup>, Ihudiebube-Splendor C.N.<sup>1</sup> Elodi L.O.<sup>2</sup>, Ezenwuba C.O.<sup>3</sup>**

<sup>1</sup>*Department of Nursing Sciences, Faculty of Health Sciences and Technology, University of Nigeria, Enugu Campus, Enugu, Nigeria*

<sup>2</sup>*Department of Educational Management and Policy, Chukwuemeka Odimegwu Ojukwu University, Igbariam*

<sup>3</sup>*Department of Nursing Sciences, Imo State University, Owerri Imo State, Nigeria*

---

## **ABSTRACT**

Problem-based learning (PBL) method has been thoroughly and scientifically explored in a variety of fields but its viability for fostering preparation for self-directed learning readiness (SDLR) in a research method course has not yet been investigated. This study was aimed at evaluating the effect of PBL on SDLR among Nigerian nursing students who registered for a research methodology course. In this quasi-experimental study, a total of sixty-four 400-level nursing undergraduates were recruited from two government-owned universities in Southeastern Nigeria and randomly grouped into two: experimental and control groups who were exposed to PBL and traditional teaching methods (TTM) respectively from April through July 2021. Data was collected using a validated self-directed learning readiness scale (SDLRS) which was administered before and after the intervention while demographic information was obtained using a structured questionnaire. An SDLRS mean score of  $\geq 3.75$  implied a high SDLR. In the pre-test, SDLR gave an overall score of  $3.99 \pm 0.39$  and  $3.87 \pm 0.44$  for TTM and PBL respectively while the post-test gave an overall score of  $3.84 \pm 0.77$  for TTM and  $3.89 \pm 0.84$  for PBL. There was a statistically significant difference in the mean scores of pre-tests and post-tests ( $p=0.019$ ). The PBL had a positive effect on the SDLR of Nigerian nursing undergraduates.

**Keywords:** *Teaching methods, Nursing students, Research methods course, Traditional teaching methods, Problem-based learning*

\*Author for correspondence: Email: [paulina.chikeme@unn.edu.ng](mailto:paulina.chikeme@unn.edu.ng); Tel: +234-7036488450

Received: September 2022; Revised version Accepted: December 2022

DOI: 10.4314/ajbr.v26i1.9

---

## **INTRODUCTION**

Research methodology is a core course in the Nursing education program. Good knowledge of research not only improves the quality and standards of nursing care but also can lead to the nurses' personal and professional development (Niederhauser *et al.*, 2005). Teaching of research methods is done using two methods which are the traditional teaching methods (TTMs) and the problem-based learning (PBL) approach. The traditional teaching method is a teacher-directed method of teaching designed to encourage learners to sit and listen (Tularam, 2018). In the methods, lectures are intended to provide fresh materials to a wide number of students (Gehlen-Baum & Weinberger 2014) although, studies (Okoye *et al.*, 2019; Vandeyar *et al.*, 2007) reported the use of TTM in small groups. The Traditional teaching

method is important when teaching specific facts and core abilities as well as paving way for the local and direct presentation of factual information Marmah (2014).

Despite its advantages, the TTM has its own drawback because it is a one-way process with little debate, questioning, or direct practice, thus producing students with more superficial knowledge than other teaching methods (Marmah, 2014). The fact that TTM focuses more on information rather than the students, results in students learning less when compared to those that were taught using PBL (Franklin, *et al.*, 2014; Al-Rawi, 2013). This could be attributed to the fact that instead of activating students to explore for themselves, the TTM instructs them on what to accomplish (Miles, 2015). The implication is that the students are limited to the knowledge and experience of their teacher which is ineffective

for higher-order thinking skills (Koch, 2016) and has the potential to stifle students' inventiveness and fosters rote learning. These deficiencies encountered in TTM has made researchers look for alternative leading to the birth of a PBL method also known as a self-directed learning method.

Self-directed learning method (SLDM) is a process in which a person, with or without the assistance of others, diagnoses their learning needs, formulates learning goals, identifies human and material resources for learning, selects and implements appropriate learning strategies, and assesses learning outcomes (Effiom-Edem *et al.*, 2020). In the context of nursing education, El-Gilany *et al.*, (2013) described SDLM as learning in freedom with the learner taking primary responsibility for deciding ahead of time what is to be done, when it is to be done, how, and evaluating the effort. The main tenet is that students are responsible for their learning beyond what is offered by an external entity (e.g., faculty member, the curriculum). More so in SDLM, the learner takes the lead by creating learning objectives, identifying assessments that provide feedback, and finding resources to assist them in achieving their objectives. By taking charge of their education, students assume responsibility for any actions that were previously dictated by the instructor and are now free to promote learning (Premkumar, *et al.*, 2018; Abraham, *et al.*, 2008). This, therefore, increases the self-directed learning readiness (SDLR) of students which is needed to enhance their performance in the examination. As a result, SDLR gives the student a sense of mastery and autonomy, as well as a sense of purpose in the educational process. The SDLR can be evaluated using the self-directed learning scale (SDLRS) which is made up of three subscales which are self-control, desire for learning, and self-management. The benefits can be connected to increased knowledge and can successfully improve students' emotional and psychomotor domains (Karimi *et al.*, 2011). In addition, Avdal (2012) reported that students subjected to SDLM performed better than their peers subjected to TTM. Murad *et al.* (2010) also posited that SDLM was more effective and better than traditional teaching approaches in the acquisition of clinical skills, knowledge, and attitudes.

Baccalaureate nursing students in Southeast Nigeria offering research methodology are taught using TTM and studies have shown that there is a decline in their performance (Dadipoor *et al.*, 2019; Chukwu *et al.*, 2016). This poor performance can be attributed to the teaching methods used. So, it becomes imperative the impact and efficacy of other teaching methods be explored, hence the present study. It is expected that the findings of this study will contribute to the literature and also bring to the limelight the level of SDLR among nursing undergraduates and or the most effective teaching method that helps students develop SDLR. It will also have implications on the teaching methods employed while teaching students and the success rate. Hence, the specific objectives of the study were to: ascertain the pre-intervention level of SDLR of nursing undergraduates in the selected Department of Nursing Sciences; assess the posttest level of SDLR, and determine if a significant difference exists in the SDLR of Nursing undergraduates exposed to PBL and those exposed to TTM.

This study is therefore, aimed at assessing the effect of SDLM on students offering research methodology at universities in Southeast Nigeria.

## MATERIALS AND METHODS

**Research design:** This study adopted a quasi-experimental study design.

**Participants:** Two classes of 400-level Nursing undergraduates from two purposively selected government-owned tertiary institutions in Southeastern Nigeria participated in this study. Class A received the problem-based learning (PBL) treatment (experimental group) and class B received traditional teaching methods-based instruction (control group). A total of 64 students, with each class made up of 32 students were recruited for the study. Although the two classes were comparable in terms of complete CGPA over the three previous years, there were individual differences in the grade levels. Nonetheless, the achievement test score distribution for high achievers and low achievers was very similar between the two classes. Specifically, the average CGPA for Class A's high and low achievers were a CGPA of  $\geq 2$  high achievers, while a CGPA of  $< 2$  implies low achievers based on their three previous years' transcript. For this, the two classes were very similar in terms of the academic test score distribution. All the males who met the inclusion criteria participated in the study, because of the few males, whereas the females were randomly recruited. The deficiencies in the number of males were made up with the expected number of females with the same academic ability since the assessment was based on the effects of the teaching methods.

**Data collection:** The self-directed learning readiness scale (SDLRS) used in this study is a 40-item instrument developed by Fisher *et al.*, (2001) and was obtained on request. The 40-items were grouped into three domains: control of one's learning (15 items), desire for learning (12 items), and self-management (13 items). The instrument asked participants to select one of a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) with higher scores indicating higher trends of SDL. To avoid response set bias, certain items 3, 11, 20, and 40 were negatively phrased and their scores were reversed while calculating the total and subscales scores. The internal reliability coefficient in Fisher *et al.* was 0.857 for the sub-dimension of self-management, 0.843 for a desire for learning; 0.830 for self-control, and the overall SDLR was 0.93. (Fisher *et al.* 2001). In this study, the reliability coefficients were subscale 1= .756 (self-management), subscale 2= .730 (desire for learning), subscale 3= .908 (self-control), and overall = .945 was obtained. The difference between pretest and post-test results on students' skills of SDL determines the effectiveness of the two teaching methods, on students' self-directedness in learning

The self-developed instrument for demographic characteristics comprised four items which included the name of the institution, age, gender, and marital status.

**Ethical Considerations:** Ethical approval for this study was obtained from the Institutional Review Board of the

University of Nigeria Teaching Hospital Enugu Nigeria (NHREC/05/01/2008B-FWA00002458-IRB00002323).

Participants gave written informed consent and an untraceable number was assigned to the tools of assessment of each participant to hide their identity.

### **Problem-based learning intervention**

The procedure was organized into five phases based as follows:

*Introductory phase:* The researcher briefly explained to the participants the concept of PBL and its processes during their first contact. Participants were randomly assigned to a subgroup of eight (8), consisting of males and females, high achievers and low achievers followed by the introduction and appointment of a coordinator and a recordkeeper. Participants received a copy of the intended student behavior in PBL class.

*Implementation phase:* To direct the group's thought and debate while keeping an eye on attaining the overall objectives, the researcher presenting the challenge first went through the lesson's objectives. Following the distribution of copies of the PBL intervention scenario on the research technique problem, students in each group sat in an eye-contact position. Before discussing the subject matter, students stated what they know, do not know, and intend to know. This prompted them to examine their learning challenges. Students used reference materials, asked questions, and consulted the literature on the subject. The students subsequently explained, ranked, and assigned learning assignments to each group member. By challenging, probing, and encouraging critical thought, the researcher assisted in this process. Only, when necessary, the researcher offered ideas. This enables the researcher to pique interest and inspire creative thinking on the part of the students. A session lasted for 2 hours every Tuesday and Friday throughout the 8 weeks (1 hour 30 minutes of group engagement, and 30 minutes teacher- students interaction), following this, the researcher scheduled the next meeting.

*Re-examination phase:* The students met the following week and were instructed to reflect on the previous session to determine if their original assumptions had changed or not. If so, students were then required to examine the change. Revisiting the previous session gave them fresh insight into the old. In some instances, they were required to verbally present knowledge, make connections between newly learned knowledge, and consider alternative scenarios in which they might apply their new knowledge. As they worked through the problems, these challenges helped students define new learning problems and understand that learning is a continuous process that one must constantly endeavour to investigate. They verbally presented their results after the sessions and prepared a summary note on the subjects covered to turn in the following week. The assignments served as a recap of what students learned and a fallback for lessons to come.

*Group facilitation phase:* Each group coordinator served as a facilitator in her/his class. The researcher moved around the groups, encouraged students' participation, and elicited pertinent information from them. The researcher during the interactive session observed that students demonstrated some

behavioral issues, such as chattering, frowning, withdrawing, and overall restlessness.

*Evaluation phase:* Following the PBL sessions, the group was evaluated in form of quizzes based on the lesson goals. To evaluate the effect of each teaching method used on students' SDLR, the researcher administered the SDLRS to the students one week before the final exam (post-test).

### **The Traditional Teaching Methods-based classroom**

The traditional teaching method-based classroom (Class B) used a lecture-based teaching approach, a method widely used by tertiary institutions in Nigeria. The instructional content was the same as Class A. During each weekly class meeting, the teacher gives out reading assignments to Class B with related reference textbooks regarding the coming week's lecture. A total time of 1.30 hours of lecture and 30 minutes of interaction was spent on teaching each day. This is similar to the time Class A (PBL group) spent in their weekly group interactive learning. In addition, after each weekly classroom learning, lecture notes were distributed; these lecture notes provided the students with relevant information for self-study and review. It is important to know that, while Class A (PBL group) was put in small subgroups following the heterogeneous grouping principle and were frequently engaged in group discussion and interaction activities, the students in the Class B group were not put in groups and only received lecture-based teaching through the projected PowerPoint slides. The group was taught every Monday and Thursday throughout the 8 weeks.

**Data analysis:** Data analyses were done with the aid of Statistical Package for the Social Sciences (SPSS) version 25 and Microsoft Excel. Descriptive statistics of the means and standard deviations were used for the scaled components. Any response  $< 3.75$  was considered a low SDLR while  $\geq 3.75$  implied a high SDLR. An independent sample t-test was used to test the difference between the pre-and post-test results of Class A (PBL) and Class B (TTM) students at 0.05 level of significance.

## **RESULTS**

Table 1 shows the demographic characteristics of the students. Their mean and standard deviation age was  $25.59 \pm 4.96$  for the TTM group and  $23.59 \pm 1.58$  for the PBL group while the modal age group was 20-24 years for the TTM group (50.0%) and 20-24 for the PBL group (71.9%). The majority of them were females [TTM (78.1%), PBL (65.6%)], almost all were singles [TTM (87.5%), PBL (100.0%)] while 46.9% for the TTM group and 59.4% for PBL group had the high mental ability

The result in Table 2 showed that the pre-test means and standard deviation self-management subscale of the SDLR was fairly high in the TTM group ( $3.81 \pm 0.55$ ) and low in the PBL group ( $3.45 \pm 0.71$ ). The desire for learning was high in the 2 groups [TTM ( $4.19 \pm 0.50$ ), PBL ( $4.19 \pm 0.39$ )] while self-control was fairly high in the TTM ( $3.98 \pm 0.44$ ) and PBL group ( $3.98 \pm 0.49$ ). The overall SDLR mean scores were fairly high in the 2 groups TTM ( $3.99 \pm 0.39$ ), and PBL ( $3.87 \pm 0.44$ ).

**Table 1:**  
Demographic Characteristics of the Students

	Item	TTM (n = 32)	PBL (n = 32)
Age	20-24	16(50.0)	23(71.9)
	25-29	12(37.5)	9(28.1)
	30 +	4(12.5)	0(0.0)
	Range	20-45	21-26
	M±SD	25.59±4.96	23.59±1.58
Gender	Male	7(21.9)	11(34.4)
	Female	25(78.1)	21(65.6)
Marital status	Single	28(87.5)	32(100.0)
	Married	4(12.5)	0(0.0)
Mental ability	High	15(46.9)	19(59.4)
	Low	17(53.1)	13(40.6)

**Table 2.**  
Pre-test Self-directed learning readiness in students exposed to PBL and TTM- based learning

Variables	TTM (n=32) Mean ± SD	PBL (n=32) Mean ± SD
Self- management	*3.81 ± 0.55	3.45 ± 0.71
Desire for learning	+4.19 ± 0.50	+4.19 ± 0.39
Self-control	*3.98 ± 0.44	*3.98 ± 0.49
Self-directed learning readiness	*3.99 ± 0.39	*3.87 ± 0.44

\* Skills rated fairly high; + skills rated high; † skills very high.  
Domain & sub-domain means were used instead of totals

As shown in Table 3, in the post-test, the self-management subscale was fairly high for the TTM group (3.75±0.64) and low for the PBL group (3.72±0.67). The desire for learning was high in both TTM (4.00±0.71) and PBL (4.14±0.75). Self-control similarly was high in both TTM (4.01±0.40) and PBL group (4.06±0.60). The overall SDL readiness was fairly high for TTM (3.84±0.77), and PBL (3.89±0.84).

**Table 3.**  
Means and standard deviations of post-test self-directed learning readiness in students exposed to PBL and TTM-based learning

Variables	TTM (n = 32)	PBL (n = 32)
Self-management	3.75±0.64	3.72±0.67
Desire for learning	+4.00±0.71	+4.14±0.75
Self-control	*4.01±0.40	+4.06±0.60
Self-directed learning readiness	*3.84±0.77	*3.89±0.84

\*Skills rated fairly high; + skills rated high; † skills rated very high; Domain & sub-domain means were used instead of totals

Results in Table 4 showed that the students in the PBL group (MD = 0.21) had better improvement in SDL readiness than those in the TTM group (MD = 0.08) after having been exposed to the intervention (p=.0019). After the intervention, the students in the PBL group had better improvement in self-

management (MD= 0.3946), desire for learning (MD =0.0408), and self-control than their counterparts in the control group. However, the difference in the means for the subscales for the two groups was only significant in the cases of self-management (p = 0.026) and self-control skills (p = 0.021) after the intervention

**Table 4:**  
Post-test of nursing Mean Score Difference in the Self-directed learning readiness between Pre-test and undergraduates exposed to PBL and TTM group

Variables	PBL (Mean Difference)	TTM (Mean Difference)	T	p- value
Self-management	0.3946	0.1492	2.370	0.026
Desire for learning	0.0408	0.0075	0.304	0.764
Self-control	0.1853	0.0780	2.439	0.021
Self-directed learning readiness	0.2100	0.0800	2.397	0.019

**DISCUSSION**

This study sought to examine the effect of SDLM (PBL) and TTM on the SDLR of nursing undergraduates in a research methodology course in two selected tertiary institutions in Southeastern, Nigeria.

Only 18 (28%) of the 64 nursing students who participated in the study from the pre-intervention stage to the post-intervention could be identified as male. The study by Nneka *et al.* (2019), which found that nursing is a profession with a female preponderance in Nigeria as it is in other countries, provides justification for this. In a similar vein, the tender image of nursing has been employed to represent the pinnacle of femininity. These results concur with those of studies by Meadus and Twomey (2011), and Mullan & Harrison (2008) which reported that only 5% of nurses were males in Canada and the United States respectively. In 2006, men made up only around 23% of Iran's nurses (Khosravi *et al.*, 2009).

The findings showed that nursing undergraduates at the pre-test stage had the required levels of SDLR except for the self-management subscale which scored low for the PBL group. This is an indication that more work and resources are needed in the area of self-management abilities to enhance independent learning. TTM group had negligibly the best overall SDLR. The positive result obtained in this study is justifiable since the 400-level students involved in this study have had previous learning exposures in the previous three years which must have enabled them to prioritize their problems and apply the appropriate interventions in learning. It may also be that their encounter with different problems and struggles during their clinical experience helped them develop the knowledge and skill to be more autonomous in learning. This result is consistent with a study conducted by Smedley (2007) which found that nursing students in Australia performed poorly on the self-management subscale, better on the desire to learn, and at their best on self-control. In addition, Soliman *et al.* (2015) discovered that King Saud University students scored highest in the self-control subscale and lowest

in the self-management domain. However, this finding conflicts with those of Williams *et al.* (2013) who reported that the self-control and self-management dimensions had modest scores while the desire for learning dimension had the highest mean score. The fact that 64 students were recruited for the present study while 259 were involved in William *et al.* investigation suggests that the huge sample size utilized in their study must have had an impact on the self-control readiness scores of students. The students were at their best with SDLR at the pretest stage without exposure to treatment is at variance with reports of Millanzi *et al.* (2012); El Seesy *et al.* (2017); Yuan *et al.* (2012); and Safavi *et al.* (2010) who observed that nursing students' probability to demonstrate SDLR were higher when exposed to the intervention than in the control group. The sample size effect may have influenced this result. Previous studies had more samples compared to this study.

A considerable improvement was observed in the mean SDLR score of students exposed to PBL compared with that of the TTM group at the post-test stage. This is as against the result observed in the pre-intervention stage where the TTM group was at best, meaning there is a favourable association between the methods of teaching and the development of SDL. The possible reason could be due to the nature of the PBL design. The PBL approach is a method of teaching that encourages peer group interaction, and a positive attitude to learning as well stimulates higher motivation in learners. The students while presented with problem scenarios in their breakaway sessions are encouraged to partake in the learning discussion as well as make useful contributions using provided reference textbooks and online searches (ELShaer *et al.*, 2014). The fact because this is a novel teaching approach, the students must have paid more attention, were involved, and were more committed to learning evidenced in their degree of SDLR. This result is in line with the work done by Haukedal *et al.* (2018); Sayyah *et al.* (2019) that found a link between the type and nature of pedagogies used to facilitate learning among nursing students and further said the learning habits in an actual sense reflect the acceptable students' levels of SDL readiness. Contrarily, Qamata-Mtshali *et al.* (2021), in a comparative study on SDLR and learning attributes in different years of study of undergraduate nursing students exposed to traditional, lecture-based, and problem-based learning strategies found that readiness for SDL is not dependent on the dominant teaching-learning strategy used in the nursing program. One can explain this result based on the varied levels of nursing students that took part in the study, the first years because they were yet novices without much exposure to teaching styles may have given the disparity result obtained.

In the post-test - pre-test- results, the PBL group's research methods knowledge, as demonstrated by scores on SDLR, was significantly higher than that of the TTM group ( $p = 0.019$ ). All the subscales were highly rated including the self-management subscale rated low previously. This is rather a stronger indication that an association exists between the teaching method and the development of self-directed learning abilities. It implies maximizing the effect of SDLR; it is necessary to devise an educational method involving the PBL approach than the TTM method. This result, therefore, refutes

the null hypothesis that there is no statistically significant difference in the SDLR of students exposed to PBL and the group using the TTM. The outcomes are consistent with the alternative hypothesis that PBL-based learning is more effective for students than TTMs. The possible explanation is still based on the conclusion and the understanding that the PBL approach creates a more friendly environment between teachers and their students. In this method, students are free to ask more questions, and critically look at and analyze learning issues, unlike in the traditional approach that regards students as passive learners. In light of these findings, the study suggests encouraging teachers to employ PBL in the teaching process.

The observation corresponds with the report of Wekesa *et al.* (2016) who revealed that PBL encourages students to adopt a positive learning style and as well boosts their academic achievement. Millanzi *et al.* (2021) discovered that the probability of nursing students demonstrating SDLR was more times higher when exposed to intervention than in the control. Likewise, Allen *et al.* (2011) stated that PBL is a successful strategy that improves students' development in content understanding. Dissimilarly, a comparative study by Beers (2005) on pre-and post-test results of nursing students who had received PBL instruction versus those who received traditional lectures found no statistically significant differences between the two study groups with a response that PBL is equally as effective as the traditional lecture. Another comparative study by Solomon (2020) reported PBL has little effect on students' immediate knowledge retention and that the majority (63.2%) of the students prefer the lecture method as the best teaching method. It is not hard to conclude here that these students who sounded positive about TTM were not properly prepared for the PBL approach since it is a novel method thus instructor experience is crucial, it could also be that the long-preferred and long-standing lecture method-based education system had biased the student's minds of which the preference to passive learning method. It could also be that their teachers made the lecture-based method easier. More studies are expected.

In conclusion, this study showed that nursing undergraduates at the pre-test stage had the required levels of SDLR except for the self-management subscale which scored low for the PBL group, rather the TTM group had the best overall SDLR. A considerable improvement was observed in the mean SDLR score of students exposed to PBL compared with that of the TTM group at the post-test stage. Comparing the post-test - pre-test- results, the PBL group's SDLR was significantly higher than that of the TTM group ( $p = 0.019$ ). Hence, PBL has a significant positive effect on students' SDLR. Therefore, nurse educators must be equipped with this strategy to prepare nursing students to achieve their academic and professional goals.

#### **Authors' contributions**

*All the authors were actively involved in the formulation of this study. PCC designed the study, participated in the collection of the data, analyzed and interpretation of the data, and drafted the manuscript. PCC, NPO, and CNI contributed to the design of the study, analysis, and interpretation of the manuscript. PCC drafted the final report. All authors read and agreed to the final version of this manuscript*

### Acknowledgments

The authors are grateful to the heads of the two institutions involved in this study for permitting us to use their facilities in carrying out this study. We are also grateful to all participants who took part in this study

### REFERENCES

- Abraham, R.R., Vinod, P., Kamath, M.G., Asha, K. and Ramnarayan, K., (2008): Learning approaches of undergraduate medical students to physiology in a non-PBL- and partially PBL-oriented curriculum. *Advances in Physiology Education*, 32(1), pp.35-37.
- Adodo, S.O. and Agbayewa, J.O., (2011): Effect of homogenous and heterogeneous ability grouping class teaching on student's interest, attitude and achievement in integrated science. *International Journal of Psychology and Counselling*, 3(3), pp.48-54.
- Ahlam, E.S. and Gaber, H., (2014): Impact of problem-based learning on students' critical thinking dispositions, knowledge acquisition and retention. *Journal of Education and Practice*, 5(14), pp.74-83.
- Allen, D.E., Donham, R.S. and Bernhardt, S.A., (2011): Problem-based learning. *New directions for teaching and learning*, 2011(128), pp.21-29.
- Al-Rawi, I., (2013): Teaching methodology and its effects on quality learning. *Journal of Education and Practice*, 4(6), pp.100-105.
- Avdal, E.Ü., (2013): The effect of self-directed learning abilities of student nurses on success in Turkey. *Nurse Education Today*, 33(8), pp. 838-41.
- Beers, G.W., (2005): The effect of teaching method on objective test scores: Problem-based learning versus lecture. *Journal of Nursing Education*, 44(7), pp.305-309.
- Chukwu, N., Ebue, M., Obikeguna, C., Arionu, N., Agbawodikeizu, P. and Agwu P. (2016): Problems of social research in Nigeria. *Research on Humanities and Social Sciences*, 6(12), pp.1 – 10.
- Dadipoor, S., Ramezankhani, A., Aghamolaei, T. and Safari-Moradabadi, A., (2019): Barriers to research activities as perceived by medical university students: A cross-sectional study. *Avicenna journal of medicine*, 9(01), pp.8-14.
- El Seesy, N., Sofar, S.M. and Al-Battawi, J.A.I., (2017): Self-directed learning readiness among nursing students at King Abdulaziz University, Saudi Arabia. *IOSR Journal of Nursing and Health Science*, 6(6), pp.14-24.
- El-Gilany, A.H. and Abusaad, F. E., (2013): Self-directed learning readiness and learning styles among Saudi undergraduate nursing students. *Nurse education today*, 33(9), pp. 1040-4.
- Farenga, S.J. and Ness, D., (2005): Current Issues in Higher Education. *Encyclopedia of Education and Human Development*, Armonk, NY: ME Sharpe, pp.595-596.
- Fisher, M., King, J. and Tague, G., (2001): Development of a self-directed learning readiness scale for nursing education. *Nurse education today*, 21(7), pp.516-525.
- Franklin, A.E. and Lee, C.S., (2014): Effectiveness of simulation for improvement in self-efficacy among novice nurses: A meta-analysis. *Journal of Nursing Education*, 53(11), pp.607-614.
- Gehlen-Baum, V. and Weinberger, A., (2014): Teaching, learning and media use in today's lectures. *Computers in Human Behavior*, 37, pp.171-182.
- Haukedal, T.A., Reiersen, I.Å., Hedeman, H. and Bjørk, I.T., (2018): The impact of a new pedagogical intervention on nursing students' knowledge acquisition in simulation-based learning: A quasi-experimental study. *Nursing Research and Practice*, 2018.
- Huang, C.J. and Chuang, Y.T., (2008): Supporting the development of collaborative problem-based learning environments with an intelligent diagnosis tool. *Expert Systems with Applications*, 35(3), pp.622-631.
- Karimi, R., Cawley, P. and Arendt, C.S., (2011): Learning bridge tool to improve student learning, preceptor training, and faculty teamwork. *American Journal of Pharmaceutical Education*, 75(3).
- Khosravi, S., (2009): Displaced masculinity: Gender and ethnicity among Iranian men in Sweden. *Iranian Studies*, 42(4), pp.591-609
- Koch, J. (2016): Teach3: Introduction to education. Boston, MA: Cengage Learning
- Marmah, A.A., (2014): Students' perception about the lecture as a method of teaching in tertiary institutions, views of students from college of technology education, Kumasi (Coltek). *International Journal of Education and Research*, 2(6), pp.601-612.
- Miles, R., (2015): Tutorial instruction in science education. *Kıbrıslı Eğitim Bilimleri Dergisi*, 10(2), pp.168-179.
- Millanzi, W.C., Herman, P.Z. and Hussein, M.R., (2021): The impact of facilitation in a problem-based pedagogy on self-directed learning readiness among nursing students: a quasi-experimental study in Tanzania. *BMC nursing*, 20(1), pp.1-11.
- Moust, J.H., Van Berkel, H.J. and Schmidt, H.G., (2005): Signs of erosion: Reflections on three decades of problem-based learning at Maastricht University. *Higher education*, 50(4), pp.665-683.
- Mullan, B. and Harrison, J., (2008): Male and female nursing applicants' attitudes and expectations towards their future careers in nursing. *Journal of Research in Nursing*, 13(6), pp.527-539.
- Murad, M.H., Coto-Yglesias, F., Varkey, P., Prokop, L.J. and Murad, A.L., (2010): The effectiveness of self-directed learning in health professions education: a systematic review. *Medical education*, 44(11), pp.1057-1068.
- Niederhauser, V.P. and Kohr, L., (2005): Research endeavors among pediatric nurse practitioners (REAP) study. *Journal of Pediatric Health Care*, 19(2), pp.80-89.
- Nneka, E.U., Timothy, A.E., Agnes, N.A. and Elizabeth, O.O., (2019): Building a strong and sustainable health care system in Nigeria: The role of the nurse. *International Journal of Nursing and Midwifery*, 11(7), pp.61-67.
- Ntibi, J.E.E., Agube, C.C. and Neji, H.A., (2020): Effect of concept mapping, gender and school location on students' academic achievement in Physics in Calabar, Nigeria. *Journal of the Social Sciences*, 48(3).
- Okoye, H.C., Meka, I.A., Ugwu, A.O., Yahaya, I.A., Otokunefor, O., Ojo, O.O. and Ugwu, E.O., (2019): Perception of problem-based learning versus conventional



teaching methods by clinical medical students in Nigeria. *The Pan African Medical Journal*, 33.

**Premkumar, K., Vinod, E., Sathishkumar, S., Pulimood, A.B., Umaefulam, V., Prasanna Samuel, P. and John, T.A., (2018)** Self-directed learning readiness of Indian medical students: a mixed method study. *BMC medical education*, 18(1), pp.1-10.

**Qamata-Mtshali, N. and Bruce, J.C., (2018):** Self-directed learning readiness is independent of the teaching and learning approach in undergraduate nursing education. *Nurse Educator*, 43(5), pp.277-281.

**Safavi, M., Shoostari, S., Mahmoodi, M. and Yarmohammadian, M.H., (2010):** Self-directed Learning Readiness and Learning Styles among Nursing Students of Isfahan University of Medical Sciences. *Iranian Journal of Medical Education*, 10(1).

**Sayah, N. and Rashvand Semiyari, S., (2019):** Determining the Relationship between Learners' Beliefs, Peer vs. Teacher-Ratings, and Iranian EFL Learners' Writing Performance. *Journal of new advances in English Language Teaching and Applied Linguistics*, 1(2), pp.136-158.

**Smedley, A., (2007):** The self-directed learning readiness of first-year bachelor of nursing students. *Journal of Research in Nursing*, 12(4), pp.373-385.

**Soliman, M. and Al-Shaikh, G., (2015):** Readiness for self-directed learning among first-year Saudi medical students: A

descriptive study. *Pakistan Journal of Medical Sciences*, 31(4), p.799.

**Solomon, Y., (2020):** Comparison Between Problem-Based Learning and Lecture-Based Learning: Effect on Nursing Students' Immediate Knowledge Retention. *Advances in Medical Education and Practice*, 11, p.947.

**Tularam, G.A., (2018):** Traditional vs Non-traditional Teaching and Learning Strategies-the case of E-learning! *International Journal for Mathematics Teaching and Learning*, 19(1), pp.129-158.

**Vandeyar, S. and Killen, R., (2007):** Educators' conceptions and practice of classroom assessments in post-apartheid South Africa. *South African Journal of Education*, 27(1), pp.101-115.

**Wekesa, N.W. and Ongunya, R.O., (2016):** Project-based learning on students' performance in the concept of classification of organisms among secondary schools in Kenya.

**Williams, B. and Brown, T., (2013):** A confirmatory factor analysis of the Self-Directed Learning Readiness Scale. *Nursing & health sciences*, 15(4), pp.430-436.

**Yuan, H.B., Williams, B.A., Fang, J.B. and Pang, D., (2012):** Chinese baccalaureate nursing students' readiness for self-directed learning. *Nurse education today*, 32(4), pp.427-431.