



*Original Research Article*

# Use, challenges and barriers to use of problem-based learning by nurse educators: A study in Fako division, Cameroon

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Abstract

The study aimed at investigating the proportion of nurse educators in Fako Division who use PBL in the training of student nurses, and the factors, barriers, and challenges associated with its use. A descriptive and analytic cross-sectional design with mixed methods was used. 105 nurse educators were recruited using the cluster random sampling method and were involved in the study. Data were collected using questionnaire which covered all the objectives of the study. The data collected was analysed using EPI Info software. Out of the 80 nurse educators who participated in the study, 85% had used PBL in training nursing students. The Use of PBL was associated with previous training on PBL (76.5% vrs 96% p= 0.04) and teachers access to internet (94.4% vrs 69.6%, p= 0.02). Four major challenges and barriers indicated were time constraint, lack of knowledge, lack of training, poorly-equipped library. The use of PBL by nurse educators in training nursing students is high. However, use is not frequent and it's a personal choice. This irregularity in use could be because they face diverse challenges and barriers. Overcoming the challenges and barriers may have an impact on the teaching skills of nurse educators which may have a positive effect on nursing students' ability to develop skills.

**Keywords:** Barriers, Challenges, Nurse Educator, Problem-Based Learning.

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## INTRODUCTION

Nursing education has begun to shift from teacher-centered learning to student-centered learning where students are required to actively seek knowledge. Enhanced problem-solving ability affects the quality of nursing care and plays a vital role in the outcomes of nursing care Uys et al. (2004). In the 21<sup>st</sup> century where there is an increased complexity of the challenges faced such as provision of health care, ensuring equity within all of our educational and judicial systems coupled with the complexities of energy production and conservation, preserving the planet, and fighting terrorism, it is necessary that students are taught in a way that can make them problem solvers Barell (2006).

However, the current nursing education in most parts of Africa is based on a traditional, textbook – centred and teacher-centred model that ignores the central role of students in learning activities Luo et al. (2014).

The National League of Nursing (NLN), USA, as stipulated by Tanner (2007) advised nursing schools to examine what students learn and how learning takes place. They urged nurse educators to critically assess the pedagogies they are using and to shift to new pedagogies that will better prepare student nurses for nursing practice. Nurse educators are expected to use methods that promote student-centred, active learning instead of passive learning strategies such as the

traditional lecture method. Problem Based Learning (PBL) is one of the methods that promote student-centred, active learning as well as enhance the professional development of nurses (Tanner 2006)

PBL has become a major feature of health sciences education in particular. Several schools of thought have defined PBL based on different concepts. Tanner CA. (2006) defined PBL as a process-focused type of curriculum in which students work in small groups on integrated clinical problems presented in the form of trigger materials about a sequence of patients.

Beers and Bowden reported that those nursing students taught with PBL had significant improvement in long-term knowledge retention compared with their counterpart Barrows (1996). As a student-centered approach, problem-based learning approach enables the students to be more critical in the learning process, enthused for life-long learning, accountable, and self-aware (Beers and Bowden 2005). The compelling arguments in support of PBL is optimizing nursing education outcomes and maximizing students' potential for critical thinking, problem solving and ability to meet the patient care need of the 21<sup>st</sup> century. And in the event of PBL usage in nursing schools, a continuous evaluation of its outcomes, challenges, impacts and assessment of opportunities for improvement is imperative.

The use of this teaching strategy is not documented in the Cameroon situation. This study therefore sought to specifically determine the proportion of nurse educators who use PBL and also assess the contextual factors that influence the use of this crucial teaching strategy.

The contextual factors associated with the use of this teaching strategy, challenges and barriers to its use, is not documented in Cameroon. Moreover, the challenges and barriers in the usage of PBL within the accredited nursing schools in Fako Division, South-West region in Cameroon were also determined.

## Research Questions

1. What are the major challenges and barriers that we might face during the preparation and implementation of a problem-based learning curriculum?
2. To what extent are problem-based learning students competent in basic and clinical sciences?
3. Can problem-based learning be a panacea for all current challenges in Nursing education?

## METHODS

A descriptive and analytic observational cross-sectional

design with mixed (quantitative and qualitative) method was used to carry out this study among 108 nurse educators from October 2014 to June 2015.

The study was conducted in twelve accredited nursing schools in the Fako Division. The choice of Fako division reflects a similarity in nursing education in Cameroon as it has all the levels of nursing education consisting of all cadres of teachers/educators, public and private nursing schools.

Below are the selected schools and the number of nurse educators who participated in brackets:

- Redemption Higher Institute of Biomedical and Management Sciences (RHIBMS) (15),
- St. Monica University (10)
- Maflekumen Higher Institute of Health Sciences (8)
- St. Francis School of Nursing and Midwifery (16)
- St. Francis Higher Institute of Nursing and Midwifery (18)
- St. Francis School of Health Sciences (SFSHS) (18)
- St. Jude Higher Institute of Health Sciences (8)
- Training School for Health Personnel, State Registered Nursing (TSHP-SRN) (11)
- Nursing Assistant School, Limbe (8)
- Higher Institute of Applied Medical Sciences (H IAMS) (15)
- Department of Nursing, Faculty of Health Sciences (FHS), University of Buea (15)

The selection of only nursing schools in Fako Division which is just a section of Cameroon, could make the results not applicable or generalizable to the whole nursing fraternity in Cameroon.

All teachers who are involved in the training of student nurses in public and private accredited nursing institutions in Fako Division were eligible for the study. However, nurse educators who were unwilling to be part of the study and those who were not reachable were excluded.

The minimum sample size required would be calculated using the formula,

$$n = \frac{z^2 pq}{d^2}$$

Where;  $n_0$  = minimum sample size required for infinite population

$p$  = pre-study estimate of the proportion of nurse educators who use Problem-Based Learning as a teaching strategy in Fako Division and has a value of 50% or 0.5 (because of the lack of pre-existing data),  $q = 1-p$ ;  $q = 1-0.5=0.5$ ,  $d$  = the degree of precision or the accuracy (=5% or 0.05),

$z$  = standard normal variant at confidence level of 95% (normal value is 1.96)

$$\text{Hence } n_0 = \frac{(1.96)^2 \times (0.5)(0.5)}{(0.05)^2}$$

$$= \frac{0.9604}{0.0025}$$

$n_0 = 385$  nurse educators

However, the estimated population of nurse educators in the Fako division,  $N$  is about 142.

Therefore, the minimum sample size required accounting for this finite population,  $n$ , was calculated as

$$\begin{aligned} n &= n_0 / (1 + n_0 / N) \\ n &= 385 / (1 + 385 / 142) \\ &= 385 / 3.711 \\ &= 104 \end{aligned}$$

## Participants

All the students in the second year of their 3-year nursing program participated, including 30 men and 50 women. The participants' median age was 25 years (range 21–36). The course was directed to nursing in medical and surgical hospital care units and covered 15 weeks full-time studies. Students' experiences and background varied. About half the students had some working experience from health care, while the rest had no experience at all. It was the students' first clinical placement in the nursing program. All students had experience from PBL as an educational method from their preclinical studies which included self-directed learning and group seminars based on patient scenarios.

## Thus, the study included 104 nurse educators

Depending on the minimum sample size calculated for this study (104), and based on the average estimate for the number of nurse educators in each of the schools (13), the estimated number of schools to be sampled was obtained ( $104/13 = 8$ ). The schools/clusters were numbered from one to eleven and the R software (version 3.03) used to randomly select eight (8) out of 11 clusters. The R code for obtaining the sampling units was (sample (11, 8, replace=FALSE)). After selecting the clusters, all eligible participants within each cluster were included in the study.

A pilot study was conducted to evaluate the clarity and validity of the questions and also to prevent ambiguity in the questions. The responses and reactions of participants from the pilot were then used to do the necessary adjustments and improve the final questionnaire before commencement of the study.

To diminish the effect of limited or predefined choices offered within the closed ended questions, some open ended questions were included in the structured to allow for the collection of tacit and detailed information on the various themes within the study. In all, 19 questions which was divided into four sections namely: use of PBL, factors associated with use,

challenges nurse educators face and barriers to use of PBL. The materials required for each participant was a pen, the questionnaire, and the informed consent form. The questionnaire which could be completed within 30 minutes were administered to the participants at their various working areas. Participants returned the questionnaires after completing it.

EPI Info version 3.5.4 software was used for the quantitative data analysis. First, in order to determine the use of PBL among nurse educators, frequencies and proportions of use was calculated.

To assess the factors associated with use of PBL, frequencies and proportion of the variables (i.e the socio-demographic and contextual factors) were calculated first of all and described in a single table. The outcome variable (use of PBL) was divided into two groups: those who use PBL and those who do not use PBL. The age of the population and teaching experience was recorded in years and then divided into group categories. Frequencies and proportion of those who use PBL and those who do not use PBL was described within each level of the categorical variables. This was presented in graphs and the association between each categorical variable and the outcome variable was determined using Chi-square or Fisher's exact test and p-values were indicated. For these analyses the statistical significance level was set at 5%. Finally, the responses under the section of the questionnaire on the challenges and barriers to use of PBL were described using frequencies and proportions.

## Ethical Considerations

Ethical approval was obtained from the Faculty of Health Sciences Institutional Review Board (FHS-IRB) in University of Buea, to ensure that ethical considerations are maintained.

## RESULTS

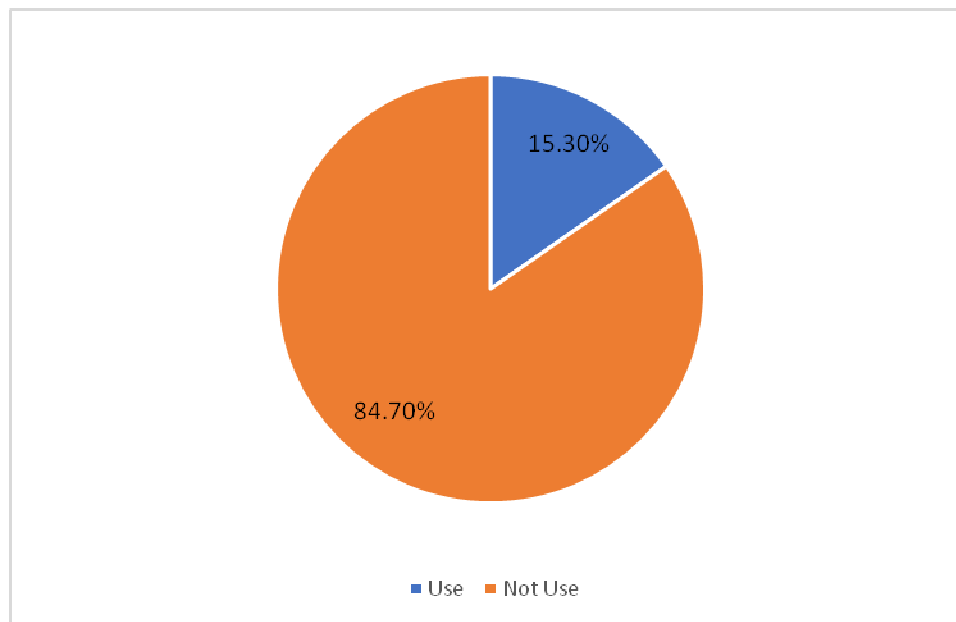
### Distribution of participants by Demographic Characteristics

A total of 80 participants out of 105 questionnaires that were administered responded. This gave a response rate of 76.2%.

As indicated in Table 1, out of the 80 participants, 44 (55%) were males and 36 (45%) were females. The mean age was 31.5 years (SD = 9.72) with the minimum being 22 and maximum 63. With respect to their educational level, 6.3% (5) of the participants had Doctorate (PhD) degree, 28.8% (23) had Masters, 55% (44) had Bachelor's degree, 2.5% (2) had HND and 7.5% (6) had State Diploma. Finally, 63.8% (51) of the

**Table 1.** Distribution of study participants by demographic characteristics.

Demographics		Frequency (n)	Percentage (%)
Age (Years)	21-30	56	70
	31-40	15	18.7
	41-50	2	2.5
	>50	7	8.8
Gender	Male	44	55
	Female	36	45
Highest level of education	PhD	5	6.3
	Master	23	28.8
	Bachelor's	44	55
	HND	2	2.5
Teaching Experience	State Diploma	6	7.5
	<5 years	51	63.8
	5-10 years	22	27.5
	>10 years	7	8.7

**Figure 1.** Proportion of Nurse Educators who use of PBL.

nurse educators had teaching experience below 5 years, 27.5% (22) had between 5-10 and 8.7% (7) had above 10 years.

### Use of PBL

This section presents the responses of nurse educators to the questions on use of PBL. In addition, participants were to indicate whether they had heard about PBL.

Out of the 80 participants, 59 responded to the question on use of PBL. 50 (84.7%) of participants had used PBL in teaching and 9 (15.3%) had not. (Figure 1)

### Characteristics of Nurse Educators' use of PBL

As shown in Table 2, fifty-seven (71.3%) participants indicated they had heard about PBL, 21 (26.3%) indicated they had not, and 2 (2.5%) indicated they were not sure.

Among the participants who indicated they had used PBL in teaching, 43 (79.6%) stated they had used PBL for less than 5 years, 10 (18.5%) between 5-10 years and a single participant for more than 10 years. Furthermore, 6 (10.5%) indicated they use PBL in every lesson, 24 (42.1%) not always but in more than half of lessons, 18 (31.6%) not always but in less than half of

**Table 2.** Characteristics of Nurse Educators' use of PBL.

Characteristics of use of PBL		Frequency (n)	Percentage (%)
<b>Awareness of PBL</b>	Aware	56	70%
	Not aware	15	18.7%
	Not sure	2	2.5%
<b>Duration of Use</b>	less than 5years	43	79.6%
	5-10 years	10	18.5%
	>10 years	1	1.9%
<b>Frequency of Use</b>	In every lesson	6	10.5%
	Not always but in more than half of lessons	24	42.1%
	Not always but in less than half of lessons	18	31.6%
	Not sure	9	15.8%
<b>Reason for Use</b>	Recommended in school curriculum	21	36.8%
	Personal choice	30	52.6%
	Student choice	1	1.8%
	Other reasons	5	8.7%

**Table 3.** Association between Socio-demographic factors and use of PBL, N = 50.

Socio-demographic factor	Number of nurse educators who use PBL (n)	Proportion of nurse educators who use PBL (%)	P value
<b>Gender</b>			
Male	28	87.5	0.39
Female	22	81.5	
<b>Age</b>			
21-30	35	85.4	1.00
31-40	9	81.8%	
41-50	0	0	
>50	6	85.7%	
<b>Level of education</b>			
PhD	4	100	1.00
Masters	16	84.2	
Bachelor	28	82.4	
HND	1	100	
State Diploma Certificate	1	100	
<b>Teaching experience</b>			
<5 years	29	80.6	0.53
5-10 years	16	94.1	
> 10 years	5	83.3	

lessons and 9 (15.8%) were not sure how often they used PBL.

In addition, 21 (36.8%) indicated their reason for using PBL was because it was required or recommended in the school curriculum, 30 (52.6%) indicated it was a personal choice, a single teacher (1.8%) indicated it was student choice and 5(8.7%) had other reasons for using PBL.

#### **Association between Socio-demographic factors and use of PBL**

In this sub-section, the Socio-demographic factors considered were gender, age, highest level of education and teaching experience.

As shown in Table 3, none of these Socio-demographic factors was found to be associated with

**Table 4.** Association between contextual factors and use of PBL, N = 59.

Contextual factors	Number of educators in each category of the predictor	Number of educators who use PBL	Proportion of educators who use PBL (%)	P value
<b>Previous training on PBL</b>				
Yes	25	24	96	0.04
No	34	26	76.5	
<b>Teachers' access to internet</b>				
Yes	36	34	94.4	0.02
No	23	16	69.6	
<b>Students' access to internet</b>				
Yes	26	24	92.3	0.19
No	33	26	78.8	
<b>Teachers' access to library facility</b>				
Yes	57	49	86	0.28
No	2	1	50	
<b>Students' Access to Library</b>				
Yes	58	49	84.5	0.85
No	1	1	100	
<b>Availability of sufficient classroom Space</b>				
Yes	48	40	83.3	0.13
No	11	10	90.9	

use of PBL.

#### **Association between contextual factors and use of PBL**

Among the contextual factors considered for the study were: Participants previous training on PBL, teachers' access to internet, teachers' access to internet, Students' access to internet, Teachers' access to library facility, students' access to library facility and Availability of sufficient classroom space.

As shown in Table 4, only previous training on PBL and teachers' access to internet were found to be statistically significant with P values of 0.04 and 0.02 respectively.

#### **Challenges faced in the use of PBL**

A number of factors, which have been identified in the literature as challenges to the use of PBL by nurse educators, were outlined and participants asked to indicate whether any of these affected their use of PBL. Participants who said 'yes' to a particular challenge were asked to explain in their own words how they

perceived the challenge. See Table 6.

As shown in Table 5, the major was time constraints, 60% (48) followed by access to internet 57.5% (46) and inadequate knowledge 55% (44). However, limited classroom space was indicated as the least challenge 28.8% (23).

Other challenges indicated by participants are: inadequate didactic materials, unfavourable policies from school administration, financial strength of students, unseriousness on the part of students, staff workload.

#### **Barriers to use of PBL**

As described in Table 7, the top two barriers were lack of training (61.3%, 49) and lack of knowledge (60%, 48) Sixty percent (48) of the participants indicated lack of knowledge was a barrier, followed by time constraints (55%, 44) then unavailability of internet access (53.8%, 43). Other barriers indicated by the participants are students' lack of computer skills, inadequate supervision of teachers, financial constraints on the part of both teachers and students, students' lack of interest in the PBL approach and the fact that PBL is not in the school curriculum.

**Table 5.** Reported challenges faced in the use of Problem-Based Learning (n= 80).

<b>Challenges</b>	<b>Frequency (n)</b>	<b>Proportion%</b>
<b>Time constraints</b>		
Yes	48	60.0
No	24	30.0
Not sure	8	10.0
<b>Access to internet</b>		
Yes	46	57.5
No	27	33.8
Not sure	7	8.8
<b>Poorly-equipped library</b>		
Yes	39	48.8
No	35	43.8
Not sure	6	7.5
<b>Limited classroom space</b>		
Yes	23	28.8
No	46	57.5
Not sure	11	13.8
<b>Lack of reward system</b>		
Yes	33	41.3
No	37	46.3
Not sure	10	12.5
<b>Inadequate knowledge</b>		
Yes	44	55.0
No	23	28.8
Not sure	13	16.3
<b>No formal training</b>		
Yes	40	50.0
No	29	36.3
Not sure	11	13.8
<b>Little experience</b>		
Yes	34	42.5
No	33	41.3
Not sure	13	16.3

**Table 6.** Nurse Educators' Explanation to Challenges indicated.

<b>Challenges</b>	<b>Frequency (n)</b>	<b>Proportion (%)</b>
<b>Time constraints</b>		
Developing problem scenarios requires much time	4	8.3
Students spend longer time to do research and give feedback	13	27.1
Limited time allocated for a lesson	11	22.9
Huge workload prevents use all the time	11	22.9
<b>Access to internet</b>		
No internet connection in school	9	19.6
Internet facility slow and expensive	9	19.6
Few monitors	5	1.25
PBL slow and ineffective without internet	9	19.6
Lack of skills to conduct search on internet	4	8.7

Table 6. Continue

<b>Poorly-equipped library</b>		
Recent books required to enable investigation on the problem	14	35.9
Limits access to relevant information	10	25.6
Library has limited volumes in all fields of healthcare	10	25.6
<b>Limited classroom space</b>		
Large classroom facilitates comfortable group activities	8	34.7
Large class sizes require large classroom space	7	30.4
<b>Lack of reward system</b>		
Salary is low and delayed	7	21.2
No reward for extra commitments	5	15.2
Motivation enhances increased output in teaching	13	39.4
<b>Inadequate knowledge</b>		
Adequate knowledge facilitates use	15	34.1
No training programs for professional growth	4	9.1
PBL is confused with other approaches	10	22.7
<b>No formal training</b>		
Effective implementation requires skills	13	32.5
No workshop on PBL	7	17.5
Inadequate information from training programs	5	12.5
<b>Little experience</b>		
Teachers lack experience in teaching in general	10	29.4
Experience enhances dexterity in use	10	29.4

Table 7. Reported barriers to the use of Problem-Based Learning (n= 80).

Barriers	Frequency (n)	Proportion (%)
<b>Lack of training</b>		
Yes	49	61.3
No	20	25
Not sure	11	13.8
<b>Lack of knowledge</b>		
Yes	48	60
No	25	31.3
Not sure	7	8.8
<b>Time constraints</b>		
Yes	44	55
No	22	27.5
Not sure	14	17.5
<b>Unavailability of internet access</b>		
Yes	43	53.8
No	30	37.5
Not sure	7	8.8
<b>Lack of reward system</b>		
Yes	35	43.8
No	32	40
Not sure	13	16.3
<b>Unavailability of library</b>		
Yes	34	42.5
No	37	46.3



Table 7. Continue

Not sure	9	11.3
<b>Job satisfaction</b>		
Yes	31	38.8
No	36	45
Not sure	13	16.3
<b>Educational policy</b>		
Yes	34	42.5
No	28	35
Not sure	18	22.5

## DISCUSSION

### Use of PBL

A fairly higher proportion (84.7%) of nurse educators in Fako, use PBL in the training of student nurses albeit not frequent. This is quite encouraging but the significant proportion of use observed could be attributed to the fact that a number of them had heard about PBL previously. Nevertheless, based on these, one might be tempted to think that most nurse educators in Fako use PBL in their classrooms, but it should be noted that a majority of them do not always use it but in more than half of a lesson. Moreover, more than half of these educators had used PBL for less than 5 years. As reflected in the age structure of users, a majority were between 20 and 30 years, and were recent graduate who may have been exposed to the PBL approach. This may explain the reasons why those who used PBL had used it for less than five years.

It is worth noting that PBL has been recommended by the NLN, it is effective but it is not in curricular, a greater number of nurse educators use as a personal choice, so it is problematic.

### Factors Associated with Use of PBL

The use of PBL by nurse educators in Fako discussed above was facilitated by a number of factors. Among the factors, nurse educators' previous training on use of PBL and their access to the internet were significantly associated to the use of PBL in this study. This is not surprising because knowledge and training on PBL as well as adequate learning resources which includes access to internet facilitates use of this teaching method. These findings are in tandem with a study conducted by Khumalo and Gwele (2000) on perceptions of nurse educators about PBL that is highlighted in the literature. Findings from their study indicated that in-service training of nurse educators and

clinical staff regarding PBL was found to be instrumental in the adoption and use of PBL.

### Challenges to the use of PBL

Results from this study revealed that time constraint was the greatest challenge. Similarly, Barell (2006) espoused that tutors in planning for and implementing problem-based experiences encounter frustration with the amount of time it takes. The nurse educators explained that developing problem scenarios requires much time; students spend longer time to do research and give feedback; limited time (2hours) is allocated for a lesson; and huge staff workload prevent frequent use. However, it is true time constraint may be a challenge but the issue of 2hours allocation for a lesson being inadequate may not be entirely true. These findings suggest that nurse educators lack knowledge on the PBL process.

Moreover, findings also revealed that nurse educators indicated they did not have adequate knowledge on PBL because although they use it, they have no formal training in PBL. They further explained that though PBL is being used, effective implementation requires skills, workshops on PBL are not well organised and information received from the training is inadequate. This problem is also described in previous studies by which indicated that in practice, the PBL process may be challenging and frustrating if the teacher has not undergone proper training Amakali (2013); Khumalo and Gwele (2000). Simons and Klein (2004), Deciding on the problem scenarios to design that are congruent to a particular topic may be really challenging. Appropriate teacher training is therefore imperative.

The poorly-equipped library, access to internet were further indicated by nurse educators as challenges faced in the use of PBL. This is indeed problematic. A well-equipped library as well as regular access to internet is required to facilitate proper research by both

teachers and students during PBL sessions. Barrows (2006), in his study contextualises that PBL is resource intensive and this is perceived as a major challenge if the approach has to be implemented. In the same way, in a study by Lai and Tang (2000) conducted in Hong Kong, it was revealed that lack of reward system, inappropriate physical resources which include library and classroom space poses difficulties for PBL to be implemented effectively Luo et al. (2014). Less than half of the participants indicated lack of reward system for staff is a barrier because the salary is too low and payment is delayed, and there is no allowance for extra duty. This finding is incongruent with Lai and Tang's finding that four types of constraints obstructed the successful implementation of PBL. These constraints were university reward system, teaching evaluation mechanism, resource allocation and student reception to PBL Teo (2004).

### **Barriers to the use of PBL**

It is evident from the study that nurse educators perceived time constraint as a barrier. In their view, adequate time is required for planning and the time allocated for a lesson is often two hours, therefore if PBL has to be the choice of teaching method, then, the coursework for the semester will not be completed. As highlighted by Khumalo and Gwele (2000), PBL as compared with the more traditional mode of teaching required 22% more time. They explained that when PBL is used in teaching, a 98-week lecture course required 120 weeks. Thus, when tutors consider the time per week in preparation for teaching problems, in comparison to presenting lectures, they may notice that it takes more time Simons and Klein (2004), It would be useful for us to bear in mind that the curriculum may have to be restructured if PBL has to be implemented.

Unavailability of internet access and library were also indicated by nurse educators as barriers. This may be true because although majority of nurse educators had indicated they had access to library and internet, some explained that internet was not available in the school and its environ and they have to bear the cost for internet. Likewise, if library is not available, it hinders proper investigation. This agrees with Azer (2008) who stated that PBL requires learning resources and attention should be paid to these facilities which can interfere with the success of this teaching method. A reliable source of internet and a well-equipped library covering all fields of health will be required by nurse educators in Cameroon to facilitate a successful implementation of PBL.

The study also revealed that educational policy was a barrier to the use of PBL. Some of the explanation these educators presented as a reason for not using

PBL was that policy on PBL not explicit and policy does not encourage use. This finding did not differ much from a study by Azer (2008) who acknowledged that organizational issues may interact with the characteristics of the institution in which an individual works. Organizational policies may limit the type of reforms in the curriculum that are possible. If the policy does not favor the use of PBL, then it will be an impediment. These challenges and barriers must be considered as significant issues that need close attention and further research.

### **CONCLUSION**

The issue of content coverage in PBL, for example, may be critical for some in deciding whether and to what extent to implement PBL. The question is whether PBL covers an adequate range of content. The fact that students may set their own study agenda places a tremendous amount of importance on ensuring that they are able to identify knowledge deficiencies and search for and learn new knowledge effectively. There is evidence that students are uncomfortable with this aspect of problem-based learning.<sup>47</sup> Over half of the graduates of McMaster University over the period 1972 through 1977 described the lack of definition of the core material as a deficiency in the curriculum. This lack of clarity of the objectives of PBL has been reported by students in other studies and this could reduce the quality of learning in PBL programs. It appears that PBL enhances depth of learning but not breadth. Therefore, the goal of curriculum designers should be to use problems that will lead students to the content the faculty wants them to thoroughly master the most and that will be most important to them in their clinical practice.

Also, attempts to cover all content that students encounter in medical school through PBL may not be efficient or achievable. The role of group dynamics in determining the degree of content coverage by the small group should not be ignored and therefore, optimal methods of selecting members of the group and mechanisms by which we can identify dysfunctional groups may be an important issue to ensure successful content cover by the members of the group.

Furthermore, Eaton and Cottrell provided some evidence to support the hypothesis that different teaching techniques may be more effective for improving different elements of skills learning. A highly structured technique involving breaking complex tasks down into smaller components and utilizing an internal "commentary" may be an effective way of teaching the sequential motor components of complex clinical skills. Their data suggests the need for different teaching techniques to enhance skill acquisition of medical

students. In conclusion, the challenges and the barriers discussed in this paper should not be considered as reasons for opposing PBL in curriculum innovation but rather as significant issues that need close attention and further research. Resource limitations and other constraints may force some medical schools with PBL curricula to revert to traditional learning methods.

Yet advances in educational technology, such as computer-assisted learning may well lessen the resource demands of PBL and make it more attractive to larger institutions. Problem-based learning is not a panacea for all current problems in medical education. Designer of medical curricula should understand the needs for combining PBL with other efficient means of teaching, particularly for areas that cannot be integrated or covered adequately in PBL.

The implementation of PBL has yielded positive impact on nursing students as prospective nurse professionals since its introduction in nursing education. From this study, approximately 85% use PBL in training nursing students. However, the use was not frequent and it was a personal choice.

Previous training on PBL and teacher's access to internet were the factors associated with the use of PBL. The other factors such as gender, age, highest level of education, teaching experience, students' access to internet, teacher's access to library, students' access to library and availability of classroom space were not associated with the use of PBL.

The infrequent use of PBL could be because nurse educators faced diverse challenges and barriers particularly time constraint, lack of training and lack of knowledge, inadequate learning resources, among others. This in turn may affect their effectiveness in implementing this student-centred approach. The outstanding barriers indicated were lack of reward systems and unfavourable educational policies.

If these challenges and barriers are overcome, it will have a great impact on the teaching skills of nurse educators which will eventually have a positive effect on nursing students' ability to develop 21<sup>st</sup> century skills.

### What is known about this topic

- Most nurse educators are aware of PBL and they view PBL as a positive teaching method
- PBL improves students attitude and problem-solving skills
- Time constraint and inadequate knowledge on PBL influence the use of PBL

### What this study adds

- Majority of nurse educators who use PBL are

young adults/graduates; between 20 and 30 years.

- Previous training on PBL and teacher's access to internet were the factors associated with the use of PBL
- Lack of reward system for nurse educators is not a barrier to the use of PBL if educational policy favour its use.

### Implications for policy

Educational policy makers should formulate policies that will optimize the introduction of PBL into the nursing curriculum and ensure its effective implementation in the training of nurses.

Where the use of PBL is suboptimal, training guidelines on PBL should be developed to enhance the skills of nurse educators and guide them in the use/practice of PBL. Periodical refresher courses on the whole process of PBL should be organised to update the knowledge of these educators which will in turn enhance their professional growth.

### Implications on practice

Educational and organizational policies should emphasize on providing the relevant learning resources such as internet access that will facilitate the successful implementation of PBL in the training of nursing students.

### Implications for research

Furthermore, it is recommended that further studies be conducted in the areas of: effectively and outcomes of PBL as well as perceptions of nursing students and teachers in Cameroon on the PBL approach. Extending this type of study to cover the entire South-West region will have a more representative sample to better generalise the results to the whole nursing fraternity as well recommended.

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