

The Impact of Problem Based Learning Module on Maternity Nursing Students' Experiences and Achievements

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ABSTRACT Background: Problem Based Learning (PBL) has long been used within teaching in higher education to encourage student to have an active role in learning process. PBL is a favored approach in nurse education in some high-resource countries, where learning styles have become increasingly interactive and reflective, and group sizes tend to be small. To date, there have been few if any studies of attempts to apply PBL in countries where the learning style is largely didactic, and group sizes are usually large. **Objective:** The aim of this paper is to evaluate the impact of PBL module on third year undergraduate maternity nursing students undertaking a Problem Based Learning (PBL) program for their maternity care module. **Methods:** Focus group interviews, an interview questionnaire sheet, and scholastic achievement retrospective auditing. **Results:** The evaluation of PBL was generally positive. The students reported that the interactive learning process enhanced the acquisition of multiple educational and transferable skills. They believed that these were likely to advance their future education and career development. However, they also experienced some challenges in the transition to the PBL teaching strategy. **Conclusion:** The study suggests that PBL may be a useful strategy, even in settings where the underlying educational philosophies are culturally novel, and group sizes are large. However, further preparation of students is necessary to induce the cultural changes that could maximize the benefits arising from this style of learning in a developing world context.

KEY WORDS: Problem Based Learning; Low Resource Countries; Midwifery Education; Nursing Education; Didactic; Learning

INTRODUCTION

The nature of expertise and decision-making has been examined in medicine⁽¹⁾, nursing ⁽²⁾ and midwifery⁽³⁾. Influential authors such as Eraut have proposed that medical decision-making is not linear, but based on the recognition and extension of complex patterns from one clinical case to another⁽¹⁾. These archetypal and constantly evolving patterns have been termed 'illness scripts'⁽⁴⁾. Expert nurses and midwives are

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also reported to use complex decision making styles that cannot easily be reduced to a linear account ⁽⁴⁾. Problem Based Learning was developed to account for complex case-based decision making in medicine ^(6,7). This has been successfully translated to medical education in a range of contexts, including the Gulf states ⁽⁸⁾.

Problem Based Learning has also been generalized to nursing, professions allied to medicine, and, most recently, midwifery ⁽⁹⁾. However, most of the research in the area of nursing and midwifery to date has been undertaken in high-resource countries, where learning styles have become increasingly interactive and reflective, and group sizes tend to be small ⁽¹⁰⁾. To date, there have been few if any formal studies of attempts to apply PBL in countries where the learning style is largely didactic, and group sizes are usually large. This paper reports the views of maternity nursing students who were the first cohort to undertake a PBL based module in

Mansoura university in Egypt.

BACKGROUND

Within the Egyptian higher education system there is an emerging political agenda for accrediting professional curricula. Nursing education was one of the pioneers in developing and upgrading nursing curricula to enable future nurses to be up to date with international developments, and to be motivated and confident enough to accept responsibility for self development after qualification. The authors of this paper have many years experience of lecturing on undergraduate maternity nursing program and community Medicine program. This experience has led to the conclusion that the traditional didactic lecture is not suited to all students.

The emphasis is on giving information rather than learning. Lectures represent what teachers do and believe, and not necessarily what students need. As a result, some students are lost in the teaching process. This traditional method

has been criticized in other contexts for not encouraging the development of enquiry skills, with the consequence that newly qualified nurses lack competence in the complex and uncertain world of real clinical practice ⁽¹¹⁾. In addition, didactic teaching does not allow the development of the profession, as it tends to reinforce established practices uncritically, rather than offering a space for debate, and, potentially, practice innovation ^(12,13).

The Egyptian health care and health educational systems therefore face a challenge in preparing and equipping students and practitioners with the skills and knowledge to enable them to deliver effective health care in a dynamic social context. Internationally, PBL started to feature in educational programs during the 1960's. Since then there has been a steady growth in the number of programs using this approach ^(14,15,16,17). PBL is a learning approach in which the student is introduced to a problem or situation as a trigger point

for the identification of the learning needs. McCourt and Thomas 2001 ⁽⁹⁾ noted that PBL can help to develop independence in students, promote critical thinking in real life situations, and generate creativity, but that scores in formal examination situations did not differ.

However, all these findings are based on studies in contexts where class sizes were small, and students were used to engaging in debate in the learning context. In this study, the maternity nursing module averages 150 students. The feasibility of introducing PBL-style in this context was unknown. This paper reports on students' evaluation of the subsequent introduction of PBL into the maternity nursing module. As far as we are aware, this was the first attempt to introduce PBL into a nursing curriculum in Egypt.

The original motivation for changing the course format to the PBL was the first author concern to achieve new educational objectives recently introduced by the

university, and to close the theory practice gap between the application of knowledge and real nursing practice. It was noticeable in previous cohorts that the students obtained lower marks for questions which required the kind of problem solving skills which are vital for nursing practice. The change to a PBL format was intended to prepare the student better for these aspects of practice by developing student skills of assessment, planning, implementation, evaluation and developing independent study skills in addition to oral and written presentation skills.

STUDY AIM:

The aim of this study was to assess the impact of introducing PBL module as a new learning strategy on third year maternity nursing students' experiences and achievement.

MATERIAL AND METHODS

MATERIAL

Study Design: A quasi experimental study

The need to capture the impact of the new module on students' experiences and perceptions, stimulated consideration of a range of qualitative methodologies. Qualitative evaluation research was utilized in this study. According to Polit and Hungler (1999) ⁽¹⁸⁾ this is suitable in establishing the success of a program or aspects of it.

SETTING

The study was carried out at Maternity and Gynecology Nursing Department, Faculty of Nursing, Mansoura University, Egypt.

SAMPLE

The study sample consisted of all undergraduate, third year, maternity nursing students (one hundred and fifty students) during the academic year 2007-2008.

METHODS:

1- ETHICAL CONSIDERATION

Approval was obtained from the local University Research Ethics committee. In recognition of the potential vulnerability of

students in this context, all questionnaires were anonymous. The students were all informed about the study in the first week of the course, and advised that they were under no obligation to take part, and that choosing to take part or not would not affect their education or assessment. All participants signed consent forms.

2- DESIGN OF THE PBL MODULE

The course was designed using a hybrid model of PBL to maximize acceptability, and to fit into the standard time table of 48 contact hours over 14 weeks. This comprised one class for the duration of 4 hours every week. Five maternity academic staff volunteered to run the sessions. The first author introduced the concepts and skills necessary to these staff in a series of three training workshops prior to the commencement of the course.

This process specifically aimed to develop skills in facilitation, and was based on one of the five case studies that were to

be used with the students. The 150 students entering the maternity phase of the program at the time the PBL methods were introduced were aged between 19 and 21. After the first two weeks, when they undertook standard clinical skills training in the skills laboratory, they were divided into 10 groups of 15 students each.

The cases were assigned randomly to the groups in the first instance, The course was delivered in three cycles, each of four weeks, so that each two groups were exposed directly to one case as a responsible groups and indirect to four cases as an audiences over the remaining 12 weeks of the program. The academic staff were each assigned to two groups as a facilitator. The two groups both had the same case study. The lead researcher was the coordinator between all the groups.

Box 1 represents the course time table used during the study.

Box (1)

Academic Supervision	Groups	Cycle One (Weak 3 to weak 6)	Cycle Two Weak 7 to weak 14	Cycle Three Weak 11 to weak 14
Staff 1	G1,G2	Case 1	Audiences	Audiences
Staff 2	G 3,4	Case 2	Audiences	Audiences
Staff 3	G 5,6	Audiences	Case 3	Audiences
Staff 4	G 7,8	Audiences	Case 4	Audiences
Staff 5	G 9,10	Audiences	Audiences	Case 5

Box 2: Course time table for one cycle

Weeks	Sessions
1	Introducing the PBL teaching format, aims, content. Introduce evaluation methods. Organize groups, hand out case 1
2	Compulsory tutorial, mini lecture 1
3	Mini lecture 2, submission of material related to work on the case study
4	Oral presentation of the case to the whole cohort. Critique, audience questions and clarifications

The groups had a compulsory tutorial lasting 60 minutes while they were tackling their cases to check that the students understood and could cope with the requirement of the course, and to assess their learning style. There was no compulsory tutoring during the last week: however the students were free to seek tutorial advice if they wanted it. This was to encourage students to take more responsibility for their learning.

Box 3 The contents of the presentation session for each two groups.

<ol style="list-style-type: none"> 1- Group one gives a 25 minute presentation of their solution to the case 2- Group two questions them about their presentation 3- The audience questions the two groups 4- The tutor questions the two groups and the audience 	<ol style="list-style-type: none"> 1- Group two gives a 25 minute presentation of their solution to the case 2- Group one questions them about their presentation 3- The audience questions the two groups 4- The tutor questions the two groups and the audience
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Each learning group consisted of 15 students working together to explore the learning underpinning the scenario. They had to nominate a chair each week. This was to encourage the development of communication and leadership skills. The teacher-facilitator was the scribe for the group, so that their discussions could be formulated into a readable format. The facilitator also helped the students to design ground rules to guide the group work.

TOOLS OF THE STUDY

1- Focus-group interview method has expanded rapidly during the past decade (19). Kreuger (20) asserts that the purpose of this method is to use group interaction to produce data. This method is effective

when the aim is to investigate the way ideas develop within a certain context (21). PBL uses principles of group dynamics as part of the learning process and therefore the focus group is a congruent research method.

2- A structured feedback questionnaire

Were used to account for the views of students, and to permit assessment of evaluations across the cohort. The instrument chosen was a standardized tool that was developed to assess quality of teaching on the basis of empirical and theoretical work in Mansoura University. This therefore also can permitted comparison between modules. Student feed back questionnaires were anonymous. They were one page long,

with 10 questions. They comprised a series of statements requiring a Likert-type response on a 1-3 scale, where 3=agree , 2 = neutral and 1=disagree.

3- Retrospective auditing of student scholastic achievements in recognition of the fact that some students might feel academically disadvantaged by having to undertake a radically new approach to their education, the achievements of the students were compared to their colleagues in the next semester who had undertaken the routine maternity module. However, this was only a crude indication of the possible impact of PBL on academic achievement. It provides an indication of

what aspects will need to be addressed in future comparative studies in this discipline and setting.

DATA COLLECTION

Two types of data were collected, qualitative and quantitative immediately after the module. The focus groups interviews were undertaken by the first author who has the function of guiding the groups rather than asking questions. One main question was used to guide the focus groups interviews as in Box 4. Notes were taken during the focus group by facilitators. These notes of the qualitative data were read back to the groups at the end of the session to check agreement.

Box 4

One main question was used to guide the focus groups
Tell me about the new module, process, experiences, feeling, learning skills, facilitation, resources and barriers.

DATA ANALYSIS

1- Data from the focus groups interviews were analyzed using Burnard's fourteen stages of analyzing interview transcripts. Burnard's⁽²²⁾ method is based on a

synthesis between a grounded theory and a content analysis approach. This method was used to categories and code the transcribed data. The analysis was pragmatic rather than deeply theoretical:

the purpose of the work was to locate what worked well, and what could be improved for future cohorts. The transcripts were checked by three academic staff from the community department of the faculty of medicine. The data were analyzed initially by the first author. After this, the transcripts and analysis were given to the same academic staff to review the themes and codes with the transcripts, to maximize the credibility of the analysis. There were no major disagreements about the themes that emerged.

2-Student feed back questionnaires were anonymous. They were distributed at the end of the last session of the course. The quantitative data were analyzed using the Statistical Package for Social Science (SPSS) version 15. Statistical methods used involved frequency and percentage. 3-Scholastic achievement was recorded by grade, and is reported as comparative graph.

RESULTS

Data analysis highlighted students experiences associated with the introduction of PBL as a learning strategy. The focus group data were presented first, followed by students feedback questionnaire and the scholastic achievements results.

Findings from the focus group Interviews (Qualitative data)

The responses will be discussed as a whole rather than the individual groups. The quotes presented below are sentences or fragments of discussion that emerged from the interactions in the groups. The code after the quote is the group number in which this kind of discussion took place. Three main themes emerged from the analysis: 1-acquiring new skills 2-experiences of different learning styles; and 3- pressures of time and uncertainty.

Acquiring new skills

The students were very clear in their

description about the skills they developed throughout the module. This can be summarized in Box 5.

Box 5

Acquiring new skills
<ul style="list-style-type: none"> • Interpersonal and communication skills • Writing and presentation skills • Peer to peer support • IT skills • Responsibility • Team Work and group dynamic • Searching Data Base and collecting information • Time management skills

The following selected quotes highlight some of their descriptions of the skills:

'I think it helped me to communicate, express and exchange ideas with colleagues' G3,4,6,7,8,9,10.

"Our writing and presentation skills were improved, sometimes we were correcting each others work before presentation and most of the time we were doing mock presentations to improve our presentation skills" G2,5,7 10

"It is like learning to think differently, to convey and defend our ideas." G9'

Knowing about different sources of information and how to look for the information you need' G1, 3.

"Gaining skills of using the previous knowledge and using other knowledge to build up a new knowledge I need" G 4,2,5.

"It forced and motivated us to read different sources and acquire the ability to understand difficult topics "5, 6,7,8,9,10.

"Our IT skills and presentations skills really improved" G2, 4, 5, 6, 7.

"Developing skills to look things up using the e-library and searching the net" G1, 2, 3, 5, 6,7,8,9,10.

"We learnt to organize our time and we became more organized". G1, 4, 5,6, 8, 9, 10.

Experiences of different learning styles

Most of the students reported that they enjoyed the new approaches to learning

that they were exposed to during the PBL module. This included a recognition that the responsibility occasioned by PBL provided a challenge to their normal ways of acquiring applied knowledge. The data also illustrated that gaining new skills and

learning from each other was the fundamental building block for learning for these students. The group dynamics were also important, both in terms of sharpening the challenge of competition, and in terms of the key skill of effective group working.

Box 6

Experiences of different learning styles
Peer to peer learning Self learning Learning in a group Interesting learning style Learning by competition Challenging

"We learned from working with each other and we learned a lot from our group discussion" G1, 6, 9. We are responsible for most of the course, we developed the course contents, we worked with each other to collect the information and dividing the responsibilities G7. I hated to sit in lecture and just listen, most of the time I was asleep but now there is no time to sleep. I was always in a team, thinking about something, looking for information, reading, all the group was sharing the

responsibility of finishing our assignment G6, 8. Having the responsibility for our learning was a great push and trust in our abilities G 2,4,5,6,8,9,10. It was a challenging learning approach, every session we were facing different challenges G 4,6,8,9. This was perceived to be stimulating, interesting, and exciting: It was an interesting learning environment G1,2,5,6,7,9,10. I did not get bored, it was very interesting G3,4,6,7,9. The new way of learning helped us to get closer with the

staff G1,3,4,5,8,10. I learned working in a group and how to be a member of it G2,4,5,7,8,9,10. The competition between the groups, was challenging and helped us to learn from each other G1,3, 4, 5,8,9.

Facilitation and learning Support Environment

However, dissatisfaction was also identified

in this area. Some students felt that an inadequate learning environment, and insufficient basic skills, affected their learning experiences negatively. Some groups reported feeling overwhelmed with practicalities and the skills needed for the new approach, and uncertain about how to engage effectively with it.

Facilitation	Learning Support Environment
<ul style="list-style-type: none"> • Close to academic staff • Guide and support • Role model 	<ul style="list-style-type: none"> • Inadequate learning environment • Lack of student basic skills • Time pressure • Uncertainty

Facilitation helped us focus and clarify roles. G1,2,4,5,6,8,9,10. Facilitator helped us through group dynamics. G1,2,3,5,7,8,9,10. Their role was a good models.4,5,6,8,9. The problem that hindered us at the beginning of the course was lack of our computer skills G 4,5,6,9. Inadequate access to the online library, Sometimes, we were using the staff account. G 5,8. Most of the time, limited library opening hours was

hindering us. G6,8 Lack of spaces and small classes. Most of the time it was difficult to meet as a group to discuss our problem, if it was not our lecture time” G1,8,10 Inadequate number of students' computers and internet lines to finish the assignment, most of the time we were using the internet cafe to finish our learning duties.G 5, 9,10. It was very busy semester, sometimes it was hard to find time to meet G3,6,7. I was not sure about

my knowledge, was it enough for my exams or not? G3,4.

QUESTIONNAIRE DATA

The findings are given in table 1: data from the structured questionnaire of Students Feedback (SFQ) confirm the findings from the focus groups. The majority of the respondents reported that they enjoyed the course more than the traditionally taught courses they had experienced previously. They also noted the acquisition of new skills, and of increased capacity for independent learning. However, table one also highlights students concerns regarding the time needed for study compared with the traditional course, and an inadequate learning environment for the needs of PBL approaches. Willingness to use PBL in other courses showed a bimodal distribution, which was split between a large group who would not consider this, and a second large group who definitely would.

Academic achievements of students on PBL course and traditional maternity course. Figure 1 compares the scholastic achievements of the students on the PBL maternity module, and their colleagues attending the same module were taught traditionally during the second semester. There were marked improvement in the first group were the percentage of students with very good and excellence achievements (68%,25) compared to (53%,16%) respectively between the two groups however the intention was to see the achievement of the PBL students comparing to their colleague for illustrative purposes only, and as a basis for hypothesis generation.

DISCUSSION

This study was a pragmatic examination of an educational change that was occurring in the local curriculum. As such, it is most useful in terms of local amendments to PBL-type provision. It is limited by the

inclusion of only one cohort, and by the fact that the evaluation was focused on service development, rather than being a formal in-depth research study. However, as the first account we are aware of the use of PBL in the context of large class sizes where traditional 'chalk and talk' teaching methods are the norm, we believe that the findings may be of interest to those working in other similar contexts. In general, the students taking part in the innovation enjoyed the change and reported the development of specific skills as the course progressed.

These included working in a team, improved interpersonal communication skills, the development of writing and presentation skills, stimulation of wider reading, and increased independence. These findings are supported by other studies in this area Savin-Baden 2000⁽²²⁾ Ward and Lee 2002⁽²³⁾ Rowan et al 2007a, 2007b ^(24,25). The tutorial discussion was seen to be more productive, exciting, and

challenging than traditional teaching. These findings indicated that the PBL approach helped the students to achieve their learning objectives, as has been the case in many other studies in this area. In addition, there were indications that, although the module only lasted 12 weeks, there was a subtle and positive shift in relationships between students and lecturers.

It is not clear if this persisted after the module was complete. Feelings of time pressure and of uncertainty are common to those who are undertaking PBL in one aspect of their studies while they still engaged in other more traditional courses Rowan *et al* 2007 a, 2007b ^(24,25). Under these circumstances students receive mixed messages from the different teaching and learning styles O'Hanlon *et al* 1995 ⁽²⁶⁾ Solomon and Finch 1998⁽²⁷⁾. However, further developments in using this approach in a setting where individualized question based learning is

not the norm will require additional effort to prepare both students and teachers, and to supply the resources necessary to support the kind of eclectic learning required. Overall, the academic achievements for the students were satisfied at the end of the PBL module when compared with the subsequent, traditionally taught modules.

During informal discussion, the tutors reported anecdotally that some students' grasp of the subject was much better than that of those on traditional courses. It is possible that, if it is a true measure of capacity, the lower achievement was due to the unfamiliarity of the students and academic staff with the new approach, or that the standard assessment strategy was not sensitive to the skills the PBL approach was designed to develop. It is of interest that student achievements were satisfied.

Also, students reported developing many learning and transferable skills. This is consistent with Blumberg and Michael 1992⁽²⁸⁾ and Ward and Lee 2002⁽²³⁾ who

reported that PBL students in their study developed a range of additional learning skills, and used library resources more than students in traditional courses. Introducing PBL is a cultural shift, both educationally and societal. However, as the needs in Egypt change towards future professionals who are able to use their knowledge to improve their practice, this approach offers a promising technique for the future, even in contexts of high student numbers.

CONCLUSION

This study has demonstrated that PBL is a promising learning strategy even with large groups of students who are unfamiliar with this learning style, and with academic staff who have been newly introduced to it. Additionally, it raises issues that can limit the success of PBL courses in this context, including the need to foster familiarity with the method, and to consider the adequacy in learning environment that are most appropriate. PBL would be best introduced

to nursing education with full support and commitment from the educational system. Some forms of hybrid PBL models might have to be considered at the beginning to reduce the gap between the traditional authoritative Egyptian educational system and the self-directed ethos of PBL. This study is a guide for lecturers who would like to move from a didactic style to a more student-led approach to learning and teaching and helps students develop successful strategies for learning how to learn and communicate complex information in Nursing.

RECOMMENDATION:

It is not anticipated that all results will be transferable to other contexts. However, it

is argued that some key principles that have underpinned the experience at the Faculty of Nursing are likely to be of use to other Faculties wishing to use PBL in their teaching strategies.

- The implications of the experience for the development of other PBL courses and curricula are recommended.
- Staff commitment and adequate preparation are keys for successful PBL
- Additional effort to prepare students and to supply the resources necessary to support the kind of eclectic learning required.
- Establishment of PBL committee for preparation of course content, course staff guidelines and course student guidelines.

Table 1: Distribution of the studied students according to their student's feed back questionnaire.

Statements	Disagree		Neutral		Agree	
	No	%	No	%	No	%
I have enjoyed the course	4	2.7	53	35.3	93	62.0
The course content was well prepared	32	21.3	51	34.0	67	44.7
Appropriate tutorial support system	25	16.7	67	44.7	58	38.7
Using the teamwork in learning	12	8.0	34	22.7	104	69.3
I like the new way of learning in comparing to the traditional way of learning	00	00	50	33.3	100	66.7
The time allocation was appropriate comparing to the traditional course	85	56.7	47	31.3	18	12.0
There were proper learning environment and facilities	00	00	27	18.0	123	82.0
I would like to use PBL in other courses	98	65.3	37	24.7	15	10.0

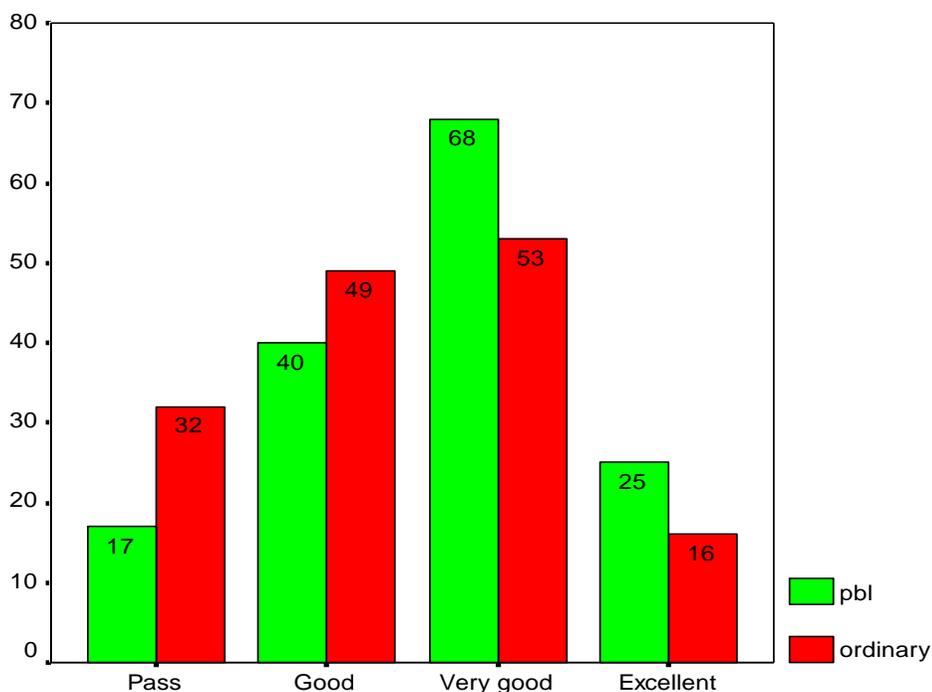


Figure 1: Final Scholastic Achievements of study participants, maternity (PBL) compared to subsequent maternity (traditionally taught) module

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