

## Evaluation of students' experience with Problem-based Learning (PBL) applied at the College of Medicine, Al-Jouf University, Saudi Arabia

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### Abstract

**Objective:** To evaluate the students' experience with problem-based learning.

**Methods:** This cross-sectional, qualitative study was conducted at the College of Medicine, Al Jouf University, Sakakah, Saudi Arabia, in October 2015, and comprised medical students of the 1st to 5th levels. Interviews were conducted using Students' Course Experience Questionnaire. The questionnaire contained 37 questions covering six evaluative categories: appropriate assessment, appropriate workload, clear goals and standards, generic skills, good teaching, and overall satisfaction. The questionnaire follows the Likert's scale model. Mean values were interpreted as: >2.5= at least disagree, 2.5->3= neither/nor (uncertain), and 3 or more= at least agree.

**Results:** Of the 170 respondents, 72(42.7%) agreed that there was an appropriate assessment accompanied with the problem-based learning. Also, 107(63.13%) students agreed that there was a heavy workload on them. The goal and standards of the course were clear for 71(42.35%) students, 104(61.3%) agreed that problem-based learning improved their generic skills, 65(38.07%) agreed the teaching was good and 82(48.08%) students showed overall satisfaction.

**Conclusion:** The students were satisfied with their experience with the problem-based learning.

**Keywords:** PBL, Al Jouf University, Students' experience, Medical education. (JPMA 67: 1870; 2017)

### Introduction

Problem-based learning (PBL) is a student-centred learning approach which relies on using a real-life patient's problem to lead learners towards achieving predefined intended learning objectives.<sup>1</sup> It was founded in 1969 at the McMaster University, Canada. It has been disseminated to more than 60 medical schools worldwide since then.<sup>2,3</sup>

PBL usually starts with introducing unfamiliar problem scenario to the learners at the first session. There may be two or more sessions with a small group of students (8-12) monitored by a learning facilitator (tutor) in an environment of group dynamic. During these sessions, learners go through six sequential jumps including: identification of the problem; define unfamiliar terms, find out facts and phenomena; generate a hypothesis; draw a concept map, and list their own learning issues out of the problem. The PBL jumps confer a great deal of brainstorming and utilisation of prior knowledge related to the problem. The PBL suits very much to the community-oriented medical curricula.<sup>4</sup>

There are many learning activities between the sessions

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for the students to accomplish the learning objectives of the PBL case scenario. These activities include self-directed learning (SDL), team-based learning (TBL), laboratory practice, and clinical skill practice. Throughout these integrated activities, PBL provides efficient acquisition of knowledge and improves learners' psychomotor skills.<sup>5,6</sup>

Problem-based learning has been modified by some institutions so as to meet their special needs. Adding plenary or short contact lectures is one example of these modifications. These hybrid paradigms aimed to overcome some limitations accompanied the original PBL practice.<sup>7</sup>

In the Kingdom of Saudi Arabia (KSA), PBL was first launched at the College of Medicine, Qassim University, in 2000.<sup>4</sup> It has spread to some other medical schools in KSA since then such as King Saud and King Abdul-Aziz universities in 2007,<sup>7</sup> and Najran College of Medicine in 2008.<sup>8</sup>

College of Medicine at Al-Jouf University was established in 2005. It is located in Sakakah, Al-Jouf region, northern Saudi Arabia. The academic system implemented at the college was inherited from the College of Medicine, Qassim University, which is the hybrid PBL. The college applies PBL curriculum for phase one students (pre-clinical three years), and the traditional lectures system is

applied for phase two students (two years clinical).

The current study was planned to evaluate the students' experience with the problem-based learning. It was an educational research and first study of its kind.

## Materials and Methods

This cross-sectional, qualitative study was conducted at the College of Medicine, Al Jouf University, Sakakah, Saudi Arabia, in October 2015, and comprised medical students of five academic levels. The participants were interviewed via a study questionnaire. This study implemented the Students Course Experience Questionnaire (SCEQ), which is a globally recognised key performance indicator. This questionnaire has been validated and is intensively used by many institutions with minor modifications.<sup>9</sup> SCEQ applied in this study contained 37 questions distributed over six evaluative categories: assessment, workload, goals and standards, generic skills, good teaching, and overall satisfaction.

Responses to the study questionnaire were selected according to Likert scale, where: 1=strongly disagree, 2=disagree, 3=neither nor, 4=agree, and 5=strongly agree.

For statistical analysis and further inference of Likert scale, we used the mean to measure the central tendency.<sup>10</sup> We relied on the percentage as a qualitative indicator.

For better interpretation of the mean responses, we considered the value of means as: >2.5= at least disagree, 2.5->3= neither/nor (uncertain), and 3 or more = at least agree.

Approval was obtained from the institutional ethics committee. Data collection did not contain invasive techniques of any kind. Data collection instrument used was anonymous and did not contain any private information. Informed consent was obtained from all participants.

## Results

Of the 250 students approached, 170(68%) responded.

In response to the SCEQ items related to "appropriate assessment category", the mean response for all students was 3.1 ( $\pm 0.97$ ) which was equivalent to 'agree'. Regarding the percentage response to the same category, 63(37%) disagreed that there was appropriate assessment, 35(20.3%) uncertain, and 72(42.7%) students agreed that there was an appropriate assessment associated with the PBL.

Students agreed that there was a heavy workload on them (mean 3.54 ( $\pm 1.36$ ), and detailed percentage shows that 48(28.2%) students disagreed, 15(8.7%) were uncertain, and 107(63.13%) agreed. For the clear goals and standards category, students recorded mean response of 3.02 ( $\pm 1.05$ ). Moreover, 58(33.7%) students

**Table-1:** Students' mean response to the SCEQ categories.

Category	Mean response/students' level					Mean response for all students' level
	1st	2nd	3rd	4th	5th	
Appropriate Assessment (there is an appropriate assessment)	3.06 $\pm$ 1.02	3.0 $\pm$ 1.3	3.11 $\pm$ 0.84	3.0 $\pm$ 0.72	3.2 $\pm$ 1.13	3.1 $\pm$ 0.97
Appropriate Workload (workload is heavy)	3.54 $\pm$ 1.37	3.93 $\pm$ 0.84	3.81 $\pm$ 1.06	2.9 $\pm$ 1.2	3.5 $\pm$ 0.95	3.54 $\pm$ 1.36
Clear Goals and Standards (Goals and standards are clear)	3.17 $\pm$ 1.72	3.37 $\pm$ 0.88	2.85 $\pm$ 0.69	3.0 $\pm$ 1.07	2.72 $\pm$ 0.64	3.02 $\pm$ 1.05
Good Generic Skills (generic skills are improved)	3.38 $\pm$ 1.66	3.25 $\pm$ 1.47	3.39 $\pm$ 1.25	3.03 $\pm$ 1.36	3.28 $\pm$ 1.17	3.27 $\pm$ 1.18
Good Teaching (Teaching is good)	3.17 $\pm$ 1.52	2.58 $\pm$ 1.39	2.60 $\pm$ 1.27	3.05 $\pm$ 1.05	2.83 $\pm$ 1.45	2.84 $\pm$ 1.06
Overall satisfaction	3.17 $\pm$ 1.45	3.12 $\pm$ 1.13	3.18 $\pm$ 1.31	3.11 $\pm$ 1.16	3.1 $\pm$ 1.27	3.12 $\pm$ 1.24

(>2.5= disagree, 2.5->3= neither/nor, and ?3 Agree)

SCEQ: Students' Course Experience Questionnaire.

**Table-2:** Frequencies and Percentages of the overall students' response to SCEQ categories.

Category	Disagree	Neither/	Agree
Appropriate Assessment (there is an appropriate assessment)	63 (37.0%)	35 (20.3%)	72 (42.7%)
Appropriate Workload (workload is heavy)	48 (28.2%)	15 (8.7%)	107 (63.13%)
Clear Goals and Standards (Goals and standards are clear)	58 (33.75%)	41 (23.9%)	71 (42.35%)
Good Generic Skills (generic skills are improved)	42 (24.45%)	24 (14.28%)	104 (61.3%)
Good Teaching	71 (42.0%)	34 (19.86%)	65 (38.07%)
Overall satisfaction	55 (32.4%)	33 (19.43%)	82 (48.08%)

SCEQ: Students' Course Experience Questionnaire.

did not agree that the goals and standards of the course were clear, 41(23.9%) were uncertain, and 71(42.35%) agreed that they were clear.

The mean response of study population to the SCEQ items related to the good generic skills was 3.27 ( $\pm 1.18$ ); 42(24.42%) students did not agree that the PBL improves their generic skills, 24(14.28%) were uncertain, and 104(61.3%) agreed that their generic skills were improved by the PBL practice.

The mean response of students to the SCEQ items relevant to the good teaching scale was 2.84 ( $\pm 1.06$ ). There were 71(42%) students who disagreed that there was a good teaching, 34(19.86%) uncertain, and 65(38.07%) agreed that the teaching related items were good.

Students showed 3.1 ( $\pm 1.24$ ) mean responses to the SCEQ items evaluating the overall satisfaction. For the percentage calculations, 55(32.4%) were not satisfied (disagreed), 33(19.43%) were uncertain, and 82(48.08%) were satisfied with their PBL course experience (Tables-1, 2).

## Discussion

Evaluation of PBL compared to traditional lecture-based learning (LBL) requires more complex techniques. Different methodologies and instruments have been adopted to assess and evaluate PBL such as quantitative survey, checklists, interviews, document reviews, observations, and many others.<sup>4,11,12</sup> The course evaluation survey (CES), designed by Sydney University, pioneered these attempts since 1999.<sup>13</sup> There are several clones of CES applied nowadays, with slight modifications.<sup>3</sup> In this work, we favoured the SCEQ as it copes with the updated trend on educational strategies. The SCEQ applied in this study contained the most valid and objectively structured paradigms identified by Barrows.<sup>6,14</sup>

This study gained 68% response rate. Although this is statistically acceptable, it reflects that the students were not willing to evaluate their academic system.

Almost all students agree that there is an appropriate assessment approach for their academic performance. Although, in some instances, students of the 2nd year don't agree, especially when it comes to the end of block exam (EOB) and the objective structured practical exam (OSPE). They feel that their results do not reflect their performance. However, this is expected because students feel confident with their PBL skills, and their expectations are usually high. It has also been reported that students in a PBL curriculum become better self-directed learners, that their confidence and feeling of belonging to the

medical school increases, and their scores in some exams could be higher.<sup>15</sup>

A few studies reported that PBL is time-consuming, and it does not impact knowledge acquisition, and the evaluation system is not satisfied and most of the students experienced stress by frequent exam.<sup>16,17</sup> These kinds of problems usually come with the a particular practice, and it is not essentially a characteristics of the PBL. All participants in this study agreed that the PBL is better than the traditional system, a fact that reflects their good perception towards PBL.

Invariably, all students agreed that there is a heavy workload on them; this goes without saying because the PBL system is mainly student-centred.

Students from 3rd level and above showed a great deal of uncertainty about the clarity of goals and standards required by the PBL blocks in their running educational blocks. In fact, students at this level usually focused only on how to minimise the workload to yield the least possible knowledge. It is assumed that students are grown enough to discern the goals and standards of the PBL by themselves.

The PBL system applied in the College of Medicine helps the students in improving their generic skills; this is what almost all student agreed about.

A majority of students in this study were uncertain about the role of tutors. They haven't yet recognised the exact role of tutor. This is expected because students tend to rely on ready-made lectures and spoon-feeding knowledge presented by faculty.<sup>18</sup> Lectures are among the resources that help students to gain knowledge in the PBL. Few contact hours are assigned for lectures as it is not the major instructional method in PBL. In turn, the role of tutors is not confined to lecturing and PBL session monitoring.<sup>19</sup> There should be more emphasis on the mentoring role of a staff member to bring students out of the status of uncertainty.<sup>20</sup> The role of the faculty in PBL activities is to facilitate the problem-solving process, "to guide, probe, and support the students' initiatives not to direct, lecture, direct, or provide solutions.

Students in this study showed an acceptable satisfaction with the PBL system. It is not possible to reach ultimate satisfaction with any education strategy, especially in medical schools. Because of this SCEQ is applied, and should be applied in regular checkpoints. Nevertheless, we thought that, at this level of our experience with PBL, we are on the right way. As an indicator of success, students of the 5th level strongly agreed that the PBL is better than the traditional lecture system.

PBL is believed to have many advantages, including increasing knowledge retention, a better understanding of basic sciences topics, integration of basic and clinical sciences, and improvement of problem-solving skills through exposing students with the problem from the first year that they were expected to see in real life.<sup>21</sup> In addition, it contributes to the development of interpersonal and communication skills, presentation skills, and promotes SDL.

## Conclusion

The students were satisfied and had a good perception towards their experience with the PBL. However, they were not sure about the exact role of tutor in PBL, and they didn't understand the methods of evaluation of their academic performance. Training course and awareness sessions should be made in a regular manner to clarify any ambiguity associated with PBL practice.

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