

## Original paper

# Problem Based Learning from Students' Perspectives in University of Kerbala, College of Medicine

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### Abstract

**B**ackground: Most higher education institutions throughout the world are searching for teaching and learning methods that will both engage students more actively in their learning and contribute to a deeper understanding of the content. In Iraq where tertiary education is expanding and many medical colleges had adapted Problem Based Learning (PBL) incorporated curricula. As a new experience, there was a need to explore the views and perspectives of the direct beneficiaries in this learning system, the students.

**Subjects and methods:** A qualitative study was performed to explore medical students' perceptions and attitudes regarding the change in undergraduate medical education that took place at the college of medicine, University of Kerbala. One hundred twenty second-year students participated in this study. Student answers were analyzed using SWOT analysis technique.

**Results and discussion:** The majority of the participants showed positive attitude and evaluation of the newly adopted system. The results suggest that the students face difficulty in bridging the gap between the theoretical and practical phase of the curriculum, some shortcomings due to the need for better logistic support and tutor training.

The study explored students opinions in six disciplines: lectures, relevance of finding objectives by the students, PBL system implementation, PBL session implementation, team work and tension problems, tutor efficiency, as well as additional students' suggestions.

**Conclusions and recommendations:** The students have perceived PBL approach, recently adopted by Kerbala medical College (KMC) consistently in a positive manner. The main reported shortcomings were related to the application rather than the concept which need further staff training and follow up.

**Keywords:** Problem Based Learning, Undergraduate students, Kerbala Medical College, Qualitative approach, Curriculum.

### Introduction

The traditional approach in medical learning was based on the bucket theory: If medical students' brains were filled with the required foundational knowledge, they are expected to be able to strategically retrieve and direct just the right subsets of it toward problems faced in clinical practice <sup>(1)</sup>. However, a lot of problems faced this learning approach, and Problem Based Learning (PBL) was designed to mitigate these problems such as, overflowing, or inappropriately filled buckets of knowledge. The main shortcomings in the

traditional teaching approach, such as: larger class sizes, greater student diversity, timing and scheduling issues, multiple classroom groups, and lack of suitable classroom space were dealt with through PBL application <sup>(2)</sup>. This is reached through the presentation of complex case histories typical of real patients as the pretext for learning. PBL is a flexible teaching method and can be used in many formats as suggested by Kaufman in 1996 <sup>(3)</sup>. This learning system rotates around a focal problem, group work, feedback, class discussion, skill development and final reporting.

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PBL encompasses a number of broad strategies that include problem solving, inquiry, project-based teaching, case-based instruction and anchored instruction <sup>(4)</sup>. Through their interactions, students learn skills that are highly relevant to their future work as doctors, such as teamwork, leadership, and delegation <sup>(5)</sup>. In addition, most reviewed studies suggested that PBL has positive influence on tutors' attitude in addition to the positive impact on students' learning in medical sciences <sup>(6-8)</sup>. Results had indicated that PBL method significantly improves students' skills such as working collaboratively in teams and communicating confidently <sup>(7,6)</sup>. PBL was endorsed by many responsible agencies such as the World Health Organization, the Association of American Medical Colleges and the World Federation of Medical Education <sup>(9)</sup>.

However, PBL, as a new teaching approach is not free from problems, a study by Wee and his colleagues (2000) identified five worst performing factors in PBL from the students' perspective with the class infrastructure at the top of the list. Different researchers have focused various respective areas in evaluating PBL, including several meta-analyses of PBL outcomes in the medical school setting. These studies reviewed different issues related to the implementation of PBL such as issues inherent to transition, assessment issues and issues related to the inherent demand of PBL concept and implementation <sup>(6, 10)</sup>. While previous research has presented results of learning gains, motivations, and teacher experiences, limited empirical research has presented student perspectives in PBL learning <sup>(7,6)</sup>.

Higher education institutions throughout the world are searching for teaching and learning methods that will both engage students more actively in their learning and contribute to a deeper understanding of the content <sup>(11)</sup>, and this search takes on special meaning in Iraq where growth in tertiary education has outpaced and many medical colleges had adapted PBL incorporated

curricula. However, PBL is a relatively new approach to most of faculty staff in the Kerbala Medical College (KMC) even though others might argue that it has been within medical education realm since five decades. Making the transition from the traditional approach to PBL format was fairly taxing for both faculty and students and necessities more training.

In KMC, teaching PBL approach is part of the curriculum of the First year students in order to explain the concept and application as well as the administration of PBL sessions, the roles and responsibilities of participants including the tutors and the students to ensure their commitment and adherence to the set guidelines which are approved by the scientific and administrative committees of KMC.

Karbala medical college students' assessment system includes performing a weekly exam for previous week lectures and laboratory training. In addition to weekly exam, Team Based Learning (TBL) sessions are conducted weekly. In addition, tutor evaluation of performance of each student and evaluation of student portfolio is running at the end of each unit. The students also perform Unit exams at the end of each unit which includes a summative assessment of each student to calculate the final marks of each unit, and the passing score is set according to the students' performance as well as objective structured clinical exam (OSCE) and objective structured practical exam (OSPE).

The preclinical curriculum in KMC, entitled the "Fundamentals of Medicine" and "Human Biology", occupies the first year of the undergraduate curriculum. Nine units system are covered in the next two years. The students in small groups meet in two PBL sessions weekly in addition to lectures and variable practical and skill laboratories related to the clinical case scenario presented in the first PBL session at the beginning of each week. During these sessions, students spend time in small groups designed to complement and

reinforce the related lectures content presented over the week days.

Concerning PBL sessions, there are 2 PBL sessions: PBL1 starting at the beginning of the each week in which there will be a presentation of the case scenario and setting of the objectives through brain storming and PBL2 in which students reflect their acquisition of scientific knowledge. As a new experience, there was a need to explore the views and perspectives of the direct beneficiaries of this learning system, the students, to gain their feedback about the different aspects related to PBL concept and application. Additionally, the little focus in most published studies was placed on student satisfaction, <sup>(6, 7)</sup>, arises the concept of this paper.

## Subjects and methods

Semi-structured questionnaires were answered by students to analyze the strengths and weaknesses of PBL and problems encountered in KMC when the Integrated Learning based on PBL was adopted in the academic year starting in September 2013 till June 2014 and first semester of the next academic year. The study was conducted between the 1<sup>st</sup> and 31<sup>st</sup> January 2015. The qualitative approach was selected to explore students' perceptions and attitudes regarding this transition. One hundred twenty eight second-year students participated voluntarily in a cross-sectional sample through answering a questionnaire about the transition to the new curriculum. The questions consisted of a combination of closed and open ended questions, where the closed questions answers were published in a separate study.

The sample included almost all students in the second year who were the first group of students undergoing the new changes from conventional to PBL teaching method. Self-administered anonymous questionnaire was prepared by the researchers. A thorough

literature review was initiated to develop the study questionnaire which included closed and open ended questions for the participants to give their opinion and suggestions on six main domains: PBL teaching method efficiency (question –Q- 1 and 10); comparison between PBL and conventional teaching methods (Q 8, 9, 14); PBL implementation in Kerbala Medical College (Q 2, 3, 4), PBL evaluation process (Q 6,7); tutors role (Q 11,12) and team work assessment (Q 13), It was not obligatory to give notes about all the questions and the students were allowed to give multiple notes about a single question. The participants were free to give negative or positive feedback on any question and these were added together according to each domain. The study explored students opinion in six disciplines concerning the concept and application: importance and shortcomings of resource lectures importance, importance of finding objectives by the students, PBL sessions, problems related to PBL implementation, students' groups problems and tension, tutor efficiency. As well as the study explored students suggestions for improving the various aspects of PBL.

These answers were analyzed using the Strength, Weaknesses, Opportunities and Threats (SWOT) model which is an analytic framework that is used to diagnose overall performance of an organization or a system for the purpose of performance improvement. The SWOT assessment technique is an identification that evaluates various aspects of the PBL teaching/ learning process and was used by many researchers <sup>(12-14)</sup>. It is an approach that is primarily intuitive and judgmental; not quantitative, and is the simplest and cheapest tool available for scrutinizing a system <sup>(14)</sup>. SWOT analysis to evaluate current and future directions can lead to the successful evolution of any organization and is therefore a valuable tool to identify aspects of the curriculum that need changes <sup>(9)</sup>.

**Results**

The response rate was 93.8%, where a total of 128 questionnaire forms were distributed and 120 questionnaire forms were obtained. Females formed the majority (71.7%) of the sample which was similar to the gender predominance in other study years in the college. Before presenting the results, it is worth mentioning that answering the questions was optional and high proportions of students neither gave positive nor negative answers, especially for open ended questions and multiple answers were also allowed.

The students answers were analyzed using frequency and percentage to evaluate their judgment on the concept as well as the implementation of the new Integrated Learning system adopted in Kerbala medical college in 2013/ 2014 academic year through pointing out to the strengths (Positive notes) and weakness (Negative notes) of each domain shown in the results. A high proportion of the students were satisfied with the new learning system as a big majority (90.3%) reported positive notes about the system, however about two thirds of the answers had negative feedback about PBL sessions (table 1).

The majority of answers indicated that PBL implementation had improved their capability in information sharing, self-reliance and team work (74 positive notes). (table 2). Seventy two positive notes were raised by the participants about the importance of the tutor role in the

implementation of the new learning system. Team work adaptation is a great positive benefit of the new system as this was indicated through 102 positive notes by the participants .

Additionally, the results showed that the students perceived the importance of the lectures as source for information and knowledge: 23 positive notes; ‘Useful and covers the main study objectives’: 21 positive notes (table 2)

On the other hand, the vast majority of answers pointed out the shortcomings of the lectures (91 negative answers) and the deficient logistics needed for proper implementation (15 negative notes, table 2).

**Discussion**

Generally speaking the majority of the participants in this study showed positive attitude and evaluation of the Integrated Learning newly adopted system by KMC and the positive feedbacks outweighed the negative ones. When a direct question, whether the strengths of the system outweighed its weaknesses was asked, a great majority of the students indicated that and they identified more opportunities than threats (Tables 1, 2).

The importance of using SWOT assessment technique is its wide coverage of all aspects of the PBL teaching/ learning process <sup>(12-14)</sup>. It is an approach that is not quantitative, but rather intuitive and judgmental as it helps policymakers to ameliorate programs according to beneficiary feedback notes <sup>(14)</sup>.

**Table 1.** The total frequencies and percentages of positive and negative answers given by the students in University of Kerbala – College of Medicine in 2015 on the main six study domains of Integrated Learning

Study domain	Number of positive answers	Number of negative answers	Number of total answers
Lectures importance and shortcomings	49 (35%)	91(65%)	140
Determining objectives importance	46 (70.8%)	19 (29.2%)	65
PBL sessions	14 (31.8%)	30 (68.2%)	44
PBL implementation	140 (90.3%)	15 (9.7%)	155
Tutors characteristics	72 (75.8%)	23 (24.2%)	95
Team work	102 (86.4%)	16 (13.6%)	118

**Table 2.** The frequency of the strengths (positive) and weaknesses (negative) feedback of students in University of Kerbala – College of Medicine in 2015 on the main six study domains in detail

Domain	Notes	Frequency
<b>Lectures importance and shortcomings</b>		
Positive notes	Important, good and increase information and knowledge	23
	Useful and covers 50-80% of the goals	21
	Meet the difficulty in obtaining resources and loss of time in the search for sources	5
Negative notes	Large bulk and number of lectures	67
	Not-consistent, lack of coordination	12
	Draw backs in lecture presentation	10
	Difficult and of higher level	2
<b>Determining objectives importance</b>		
Positive notes	Improve presentation ability, literary skills and improve personality development	20
	Improve searching, setting priorities, critical thinking, self-teaching deduction and summarization	16
	Improve English language and ability to convey concept	10
Negative notes	Disputes about setting objectives	5
	Time lost in preparation and search problems	4
<b>PBL sessions</b>		
Positive notes	Teach cooperation, communication, interaction and solving issues of scientific debate and confusion	10
	Helps interaction with students themselves and with the tutor	4
Negative notes	Timing and duration of PBL2 session is inappropriate	16
	Article presentation is time consuming and unbeneficial	7
	Vague session evaluation by tutors	4
	Drawbacks in session administration by tutor	3
<b>PBL implementation</b>		
Positive notes	Improves information sharing, self-reliance and team work	74
	The integration of the basic sciences with the clinical discipline	24
	Learning is interesting, improve analytic thinking and facilitated	21
	Better communication between students and faculty staff	11
	Weekly exam and TBL sessions are useful	7
	Skill labs are important	3
Negative notes	Misunderstanding of system application by staff and students	11
	Mechanism of distribution of students into the groups	1
	Lecture halls are unfit	1
	TBL is time consuming	1
	Evaluation of the students in general is unclear	1
<b>Tutors characteristics</b>		
Positive notes	Tutors play important role	72
Negative notes	Interference of tutor in deciding the desired objectives	14
	Variability of session management by tutors	7
	Discussion management is biased towards some students	1
	Some tutors are not enthusiastic about the integrated teaching	1
<b>Team work</b>		
Positive notes	Improving students interaction and information sharing	89
	Encourages responsibility taking	13
Negative notes	Some students dominate the sessions leaving others as dormant ones	6
	Confusion and lack of harmony	10

It helps in evaluating current and future directions of any organization and especially during periods of changes <sup>(9)</sup>. For the present study, SWOT assessment explored students' perspectives about PBL concept and application.

The students' views about the implementation of the Integrated Learning system as a whole reveal that most of them support and encourage adopting the system. They stated that 'it improves information sharing, self-reliance and team work', they admired the integration of the basic sciences with the clinical discipline: (Learning is interesting, it facilitates and improves analytic thinking) are some of their views. Additionally, they thought that the integrated PBL system of learning improved communication between students and faculty staff, others liked some components of the system such as TBL, weekly exams PBL sessions and skill labs. These findings are supported by other studies in which students seemed to be satisfied with the PBL instructional method from an overall perspective. They stated that their first impressions about PBL were positive and they found PBL as a useful methodology <sup>(4,8,9,10,12)</sup>.

Nevertheless, the students also report some drawbacks of the system implementation in terms of confusion about some aspects of PBL application from both faculty staff and the students' themselves. They declared concerns about points related to the infrastructure such as the lecture halls, allocations of the students into specific group and the assessment methods of the students which they described as 'unclear'. A study in the University of Transkei in South Africa indicated that most staff members and students were overworked and often frustrated as the learning system was transitioning into PBL <sup>(15)</sup>.

As this is a newly applied teaching method in KMC, students' suggestions about the system indicate that some of them lack the knowledge about the different aspects of this teaching method for example, some suggest cancelling important elements of

the system such as the complementary cases, article presentation, TBL sessions, portfolio, concept map, objective setting and Epidemiology lectures. Surprisingly, one student suggested cancelling objective setting which is a core element of the new teaching method as it depends on brain storming and analytic thinking. These comments reflect the confusion some students are facing while applying this method. With students evaluating the system, there is also the danger that the evaluation may prioritize student needs, and by giving them a free hand, they may be biased by subjectivity in their appraisal. Therefore the results of such studies should be regarded as a temporary measure only, and useful only for the identification of problems but not for solutions <sup>(9)</sup>. Nevertheless, some points reported by the students on the different aspects of the system can be of considerable importance to be discussed by PBL committees to apply corrective recommendations in favor of student satisfaction. The quality of student learning is not the way the courses and programs in higher education are designed, but how the students experience and understand that design (Prosser 2003). Exploring students' perceptions about objectives' determination, their positive answers showed that it improved their presentation ability, literary skills and potentiated personality development. It also has a positive influence on improved searching, setting priorities, critical thinking, self-teaching deduction and summarization as well as improving their English language fluency and ability to convey concepts. However, few students dispute about setting the desired objectives and time lost in preparation and searching through resources.

When compared to other studies, some students complained that all group members did not participate equally, and they felt that this hindered their learning process <sup>(11)</sup>. Because the curriculum encourages a sense of autonomy, flexibility, and openness, the system seems

to inspire the students with confidence. This is one of the main positive outcomes of the newly applied PBL system and was clearly expressed by participants in the present study<sup>(9)</sup>.

Although students regarded the lectures as important, useful and improve their scientific knowledge in addition to meeting the challenges in obtaining resources (35%), others stated that 'there is a large bulk in each' and also 'the number of lectures is large', 'inconsistency' of some lectures as well as 'poor coordination' of some lectures in terms of information intersection and repetition. They had few points regarding lecture presentations and that they were difficult and prepared for higher level such as postgraduates. As a new learning system, it is expected to face some challenges during its application for the first time, and this was the objective of this study to denote these challenges in an attempt to overcome them.

The students are not much aware of the different learning theories and teaching modalities and their views about the different domains reflects that clearly. What they think regarding lecture importance for example in a negative manner approves that, because the hybrid teaching modality adopted by KMC mandates self-teaching and scientific material being presented through the traditional method, some suggested to substitute the lectures by textbooks, others suggested to reduce their number, this explains their misunderstanding of the application mode of the hybrid teaching system which is a mixture of PBL and the traditional method integrating the basic sciences within the clinical discipline.

The student views regarding PBL session's management by the tutors shows some important notes which can arise at any focus group discussions and although workshops for tutor training have been performed prior to the application of the integrated system, still some concerns and challenges were raised by the students. They complained from tutor interference in

deciding the desired objectives and some tutors are not enthusiastic about the new teaching method which was reported in other studies that discuss tutor role in the success of PBL, where students 'felt pressured and unable to think with an open mind as they thought the tutor was too strict'. Some specific comments were as follows: first, 'there is no need for tutors in a PBL class'; second, 'our tutors were too strict, it hampered my learning; third, tutors need more training to conduct PBLs' and that 'tutor should have both qualities; content and process expertise, in order to have the best outcomes from the PBL tutorials'. The weaknesses that were highlighted included the resistance of some staff to change from the traditional system to the new system, the shortage of staff and the lack of motivation of some staff members<sup>(16)</sup>.

Some of students' positive impressions: "they teach cooperation, communication, interaction, solving issues of scientific debate and confusion". They saw that tutors also help in interaction between students themselves and with the tutor. On the other hand their negative notes were focused on 'inappropriateness of timing of the sessions', 'usefulness of the article presentation, foggy evaluation model of the students by their tutors and drawbacks in session administration by the tutor'. Holden and his colleagues (2001) interviewed 27 PBL tutors (n = 27) to identify problems they encountered in facilitating a hybrid PBL-lecture curriculum. They determined six main problems for students: "mini-lecturing," dysfunctional group dynamics, completing cases too quickly, superficial research, frustration with tutors who lack content expertise, and lack of support for PBL. A fundamental suspected potential predictors for these problems were students' lack problem-solving and interpersonal skills needed to benefit from PBL<sup>(18)</sup>.

The study results in this domain are consistent with those done elsewhere where the majority of the participants believed

that PBL had a positive impact on the development of their cognitive, personal, and teamwork skills. As well as development of the sense of ownership and better self-esteem gained after the experience of PBL. Other disciplines included: acquisition of knowledge, information gathering, understanding of general principles, and learning efficiency (8, 10, 11). The majority of our students perceived that as far as acquisition of knowledge and information gathering was concerned, PBL was better than traditional teaching.

All in all, Glen (2004) highlighted that 'assessment in PBL needs to be holistic in nature' to ascertain the rich nature of learning is achievable through PBL (17). Some students in this study and some reviewed resources commented that the participation and the performance of the group members and for the team as a whole during the PBL process should be uniformly assessed and this assessment should play a vital role in the final exam/evaluation. (10)

A study involving 428 students in the final and the preceding two years in Baghdad Medical College where teaching depends mainly on traditional learning reported significant willing of students for active learning, where 84% prefer active rather than traditional lecture learning (19).

Conclusions and recommendations:

The students have perceived PBL approach recently adopted by KMC consistently in a positive manner. Main reported shortcomings were related to application rather than concept.

The study results showed that PBL seems a viable methodology for medical education. It is also clear that overall measures suggest that PBL has a positive impact on students' learning in medical sciences. The responses also show that PBL sessions were well structured and provided the students opportunities to continuous focused discussion, critical thinking and team work. Some important feedback notes can be taken into consideration related to

administrative and infrastructure issues such as time management, lecture halls and faculty staff orientation to PBL.

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