

Customizing Case-Based Learning (CBL) Sessions with Limited Resources and Analysis of their Perceived Effectiveness by the Conducting Facilitators

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¹ Conception of study
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Abstract

Introduction: Intense resource involvement invites educationists to think of innovative methods for the continuation of CBL sessions while remaining within the restricted budget. The current study was planned to develop CBL sessions for second-year MBBS class during the endocrine module utilizing minimal resources and to determine the effectiveness of customized CBL methods by qualitatively analyzing experiences of the involved faculty.

Methods: This study was conducted at Foundation University, Islamabad in six months after ethical approval. In the first phase, resource limitations like time slots, well-equipped rooms, and trained faculty were identified. CBL method was adapted and modified from the Maastricht PBL 'Seven Jump' process. 7 CBL sessions were conducted as per the devised method. Semi-structured interviews of 9 CBL facilitators were recorded, transcribed, validated, and analyzed in the second phase.

Results: All facilitators believed that these sessions provided a productive, focused, intense yet enjoyable learning experience. 4 considered that large groups hindered adequate student participation, while 2 out of 9 themselves felt nervous due to large class sizes. Recap by the senior faculty member was suggested.

Conclusion: Modified CBL sessions were perceived by facilitators as an enjoyable and intense learning opportunity for both students and themselves, despite being conducted in a large group utilizing minimal resources.

Keywords: Medical Education, Problem-Based Learning, Case-Based Learning.

Introduction

Case-based learning (CBL) is an educational method closely related to the more common Problem Based Learning (PBL). CBL has features similar or derived from PBL e.g. a case, problem, or inquiry is used to stimulate and underpin the acquisition of knowledge skills, and attitudes. However, unlike PBL, the case-based format requires students to recall prior knowledge to solve clinical problems. The facilitators who are usually subject experts use a guided inquiry technique with focused objectives to provide direction to the CBL group.¹ Students in small groups (8-10) are asked to prepare in advance for the session and are encouraged to question the subject experts during the session which means the facilitators also need to be well prepared for the class. Typically, CBL sessions can take place in specialized small group learning rooms where case information is presented in a Web-based format accessible on any computer. This case information provides the basis of the small group discussion. The learners discuss the key points of a clinical case using their previously gained knowledge. Facilitators can correct or modify the incorrect concepts of the learner, and moderate the session by allowing everybody to participate in a fair manner.² Students have been shown to give incredibly positive feedback regarding their learning process through CBLs.³

Despite the various advantages of CBL, resource involvement sometimes poses a major challenge to its regular implementation and maintenance. The requirement of specially equipped tutorial rooms, recruitment of adequate numbers of qualified faculty, training workshops for existing faculty, and multiple logistic requirements⁴ can discourage CBL practice in resource-constrained universities particularly in middle and low-income countries where educational budget is often inadequate. This invites educationists to think of innovative methods to continue with CBL sessions while remaining within the limited means of their university. In doing so, maximum effort must be made not to compromise the spirit of CBL, which is to promote learning by a thought-provoking association between case under discussion and the science behind it.^{4,5} At our University, although one PBL session per module has been part of the curriculum for many years now CBLs have never been practiced in basic sciences years. Also, there is a dearth of research published to show the practicability and efficacy of CBL sessions for basic sciences years in the medical curriculum. With this background, the current study

was planned to introduce and develop CBL sessions for our second-year MBBS class during the endocrine module (endocrine module was chosen because many clinical scenarios can be prepared which are understandable at second year student level) utilizing fewer resources and to determine effectiveness of developed CBL method by analyzing the experiences of the involved faculty. This would potentially pave the way for other researchers or educators to familiarize themselves with conducting feasible CBL sessions in basic sciences and their potential benefits.

Material & Methods

This interview-based qualitative study was conducted in the Department of Physiology at Foundation University for six months after ethical approval from the University Ethical Review Committee. It was conducted in two phases. The first phase was preparatory and the second phase involved conducting the CBL sessions and gathering data from involved faculty.

First Phase:

Group of 4 medical educationists and subject experts discussed the challenges likely to be faced in conducting CBL on a regular basis. After literature review and discussion, problems like shortage of available time slots, extra teaching rooms with computer and internet facility for a class of 150 students, and an inadequate number of well-trained facilitators were identified at our setup. After this initial need assessment, it was decided to develop a resource-friendly method of conducting CBLs while maintaining its fundamental essence. Each identified hitch in conducting CBL with its possible working solutions was recorded. After listing the potential resolutions for each problem, the most practical and feasible methods while supporting the spirit of CBL were adapted and modified from the Maastricht PBL 'Seven Jump' Process.^{6,7}

For accommodating the CBL sessions in the module it was decided to avail the lecture slots which covered relatively easier topics and also time slots of few revision sessions. It was also planned to prepare short CBL scenarios with focused and limited objectives to complete each case in one session only. Prior notification of cases and topics to be covered in each CBL was decided. This would save time which is given to students for self-study after the first CBL session in recommended methods.

The second issue identified was the lack of well-equipped small group teaching rooms. For this

problem, it was decided to use the main lecture hall where students normally take their lectures in a large group. It was decided to display the scenario on the PowerPoint slide. It was decided to ask students to think of questions in their minds after reading the displayed scenario and jot them down on the sheets provided. Later, students would be asked to voluntarily read out their questions until no more new questions aroused. The facilitator using the classroom whiteboard would note the questions and for each question, the class would be asked for a response. For each answer from any student, the facilitator would invite other responses too so as to make sure that the objective of CBL is met. In the latter half of the session, a set of pre-developed questions (8-10) related to the scenario will also be displayed one by one. The students will be asked to write the answers to the displayed questions. Response for each question after comparing and matching with 10-12 students by the facilitator will be displayed in the summary points slide already prepared following the question slide. This would also save extra time slots required for the case summary in the recommended methods.

In order to cope with the problem of lack of faculty trained in conducting CBLs, it was decided that 3 senior faculty members would prepare 3 cases each and will train at least 3 facilitators from the department on those particular scenarios. The case scenarios would be on endocrine disorders with each case focusing on either hyper or hypo functioning of the endocrine gland. It was ensured to prepare material digestible in one CBL session. It was decided to involve the trainee facilitators in generating questions and preparing key summaries too. Guidelines on timing, remaining focused on case objectives, class control, and asking for assistance from experts in case of requirements were given.

Second Phase:

At the beginning of the endocrine module, students were informed about the new learning method. They were taken on board regarding how time slots would be created in their module. The endocrine module covers the basics of endocrine hormones with their dysfunctions. Regulation of hormones' secretion and their functions is under the domain of physiology. For this purpose, after the lecture on each endocrine gland one CBL session involving that hormone was introduced with prior notification. During the 7 weeks of the endocrine module, a total of 9 such CBL sessions of 1-2 hour duration each were conducted by pre-trained facilitators under the supervision of senior faculty in the lecture hall as per devised plan. At the

end of 7 weeks, a semi-structured focus group interview of 9 pre-trained facilitators (3 at a time in one group) was recorded and transcribed. Notes were also made at the time of the interview. The questions asked about the effectiveness of the CBL sessions were both direct and indirect. The advantages and disadvantages along with suggestions in improvement of the devised method for students and themselves were explored. The transcript was validated by interviewees before content analysis. The common and recurring themes which emerged from the transcripts and notes were identified and scrutinized through constant comparative analysis.⁷

Results

The framework developed to evaluate the effectiveness of customized CBL sessions based upon analysis of information gathered from CBL facilitators with teaching experience of 3 months to 1 year is shown in Figure 1:

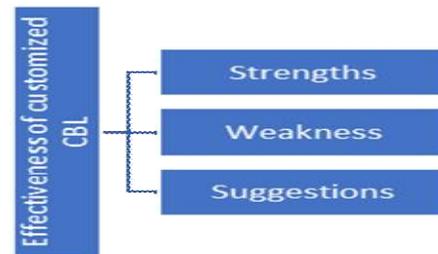


Figure 1:

The themes identified are shown in Table 1.

Table 1:

Framework	Themes
Strengths	Productive and focused Intense yet enjoyable
Weakness	Inadequate student participation Nerviness in new facilitators
Suggestions	Creation of venues Recap by senior

Detail of themes that emerged through consistent responses of all facilitators are substantiated as verbatim in text.

Strengths of the Sessions:

Productive and focused sessions:

On being asked about the effectiveness of the session, almost every facilitator was of the opinion that the CBL sessions conducted in the adapted manner were productive with minimum wastage of time in

unnecessary discussion. Students seemed to know the subject well and enjoyed relating knowledge gained from lectures to its clinical application. This was evident from reasoning and enthusiasm that was reflected in the response of students. The sessions allowed students to prepare notes handwritten by them during the session which is likely to enhance their learning. Writing responses on sheets was found a useful method of keeping every student occupied. The short case scenario presented kept students on track and helped them achieve learning objectives in the specified time. They also reported that the summary points displayed after the discussion of each question were appreciated by the students and helped clear concepts of students, especially those who were shy to ask questions in a class of 150. A sample of typical responses is as follows:

'Students seemed to integrate well their basic knowledge with the case'

'These CBL sessions were short and crisp and students wanted to attain maximum out of them'

'I think students had a good opportunity to make their own useful notes'

'Asking the students to write down the answers helped me to keep the whole class engaged'

Intense yet enjoyable learning opportunity:

All the facilitators considered this approach as an excellent opportunity for themselves to get one to one training from the senior faculty. They had to be well organized and prepared for the session which seemed to have enhanced their professionalism. They were also of the opinion that this method generated interest and motivation in their learning. They found them an enjoyable learning experience for themselves too. Few responses were as follows:

'I had to be sure that I knew everything about the case before conducting the session'

'It was good to get personal guidance from my senior'

'I quite enjoyed these CBLs'

'I think my involvement in class has improved my learning and time management'

Weakness of the sessions:

Inadequate student participation:

Four out of nine facilitators were of the opinion that the sessions should have been conducted in small groups because not every student gets a chance to speak and participate in a large class. They were also of the opinion that not many people like to respond in front of a large audience. They felt that small group teaching should be encouraged and purpose-built campuses must include small group teaching rooms

with computer facilities. Some of the responses were as follows:

'I feel that this activity would have been much more useful if we were involved with a group of maximum 10 students'

'backbenchers remained silent'

'Students would have discussed more comfortably in small groups'

'Campus must have some arrangement to organize small group teaching classes'

Nerviness:

Two out of nine facilitators confessed that they were themselves a little nervous before conducting the session because they considered it a huge task to run sessions with 150 students in one go. The Same facilitators were also doubtful about their knowledge and how to handle complex questions that might be posed by the students. This was reflected as follows:

'I was a little tense before going to the class. Wasn't sure if I could be able to give a satisfactory response'

Suggestions regarding improvement in sessions:

Create venues:

Four out of nine facilitators suggested that venues in hospitals or other campuses of the university may be arranged for such small group activities.

Recap by a senior:

Almost all facilitators were of the opinion that the sessions conducted should be summarized in the end by senior who prepared the case. They felt that this would further clarify any remaining queries and would also give students a sense of satisfaction.

Discussion

This qualitative study was planned to tailor the recommended CBL method and analyze its perceived effectiveness from the experience of facilitators who conducted them. The recommended CBL method was modified accommodating its main principles in our working circumstances. The strengths of these modified sessions as perceived by conducting facilitators showed that the students remained focused in the class despite being in a large group. There could be multiple reasons for this, for example, the methodology of the CBL process was introduced before the first CBL session and the exact topic and case to be discussed was pre-informed and therefore students were mentally prepared. This is in accordance with the method used in other studies where information in the form of lectures and/or other material is made available to the students before the

CBL session allowing some preparation to take place however case is displayed only in the first CBL session⁸. Also, students were aware that the session was short and they could not afford any ineffective or unnecessary discussion. Besides, in our devised method asking the students to write down the questions that came to their minds also kept them mentally engaged. It was also found that students responded well to the class. This could be because of the reason that every CBL session was strategically located in a time slot after covering the basic physiology of the hormone related to that case in a lecture. The other strength of these sessions as perceived by the facilitators was found to be their enhanced learning. Their better learning was attributed to the personal attention and guidance of the seniors and also a sense of responsibility to make the best use of these small focused sessions for themselves and students. However, two of the facilitators felt the anxiety to conduct these sessions. Their nervousness could be associated with the fact that they were newly inducted tutors with only three months the teaching experience. In our devised method the senior faculty-supervised the sessions which might have been the source of anxiety for the junior facilitators as they might have felt constant surveillance upon themselves. However, Hay and Katsikitis highlight those non-expert tutors who are well trained in facilitation skills are likely to be the best facilitators because they tend to be flexible⁹. Therefore, timely encouragement and thorough training can ameliorate this issue. Also, as suggested by the facilitators the senior faculty can sum up the case at the end.

Our facilitators were also of the opinion that these sessions could have been best conducted in small groups for better student participation. Unavailability of small teaching rooms was one of the major reasons to devise this full class CBL strategy utilizing the best possible available resources including time, facilitators, space, and IT facilities. Groups up to 30 students have been recommended in literature⁵ and therefore as suggested by the facilitators our class of 150 students can be divided into maybe 5-6 groups but the arrangement of extra time slots for each group would again pose a challenge if separate venues and facilitator are not available.

Various improvised teaching methods for coaching undergraduate medical students have been shown to improve the teaching-learning process for both the teacher as well as for the students. In the traditional lecture, the emphasis is on teaching alone, so it puts

the student in a passive role. Our devised CBL method met the recommended Maastricht "Seven Jump" process in terms of displaying and analyzing the case, brainstorming, formulating questions, discussion on responses, knowledge sharing and clarification of the queries^{10 11 12 13}. Our devised CBL sessions were conducted in addition to lectures in an attempt to introduce this learning method with minimum resources and disturbance in module timetables. Each CBL was planned to be placed after completion of the basics of each important hormone. They were aimed to provide a better correlation between basic and applied knowledge. This has also been concluded by Pearson *et al*¹⁰ who have shown that the innovative CBL paradigm appeared to be an effective adjunct to the traditional lecture format. In our resource-friendly method, the large group although seemed impractical but its apparent disadvantage can only be justified after analyzing students' perception of these CBL sessions and their passing scores at the end of endocrine module assessment.

Limitation

The process of case-based discussion fosters logical thinking and better learning which can quantitatively be measured by students' assessment scores or their overall perception of this learning method. This study lacks the performance and opinion of the students or comparison of this devised method with CBL sessions conducted in students who had been taught through small group and resource-intense sessions.

Conclusion

Modified CBL sessions placed in created time slots after covering each hormone in the lecture were perceived by facilitators as an enjoyable and intense learning opportunity for both students and themselves, despite being conducted in a large group utilizing minimal resources. It was however suggested by the facilitators that creating venues in hospitals or other campuses for CBL sessions would even further enhance student participation.

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