

Research Article

Impact of continuous self-assessment on the learning of medical students

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Received: 28 May 2016

Accepted: 02 June 2016

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ABSTRACT

Background: During the learning process, feedback plays an important role by helping the learner in recognition of the desired goal, evidence about present position, and some understanding of a way to close the gap between the two. Objective of the study was to improve learning by using continuous self-assessment as a tool among the medical students, this would inculcate the habit of self-directed and regular learning habits.

Methods: The study was conducted on 79 first year undergraduate medical students, where they were taught a topic from physiology and they were exposed to the weekly self-assessment sessions. The tests were corrected by the students themselves and thereafter discussed in the class by the teacher. These response sheets were collected and scrutinized by the teacher and feedback were given to each student. The progress record was maintained by the teacher showing the response of the students in terms of attendance and performance. The average scores of these students (study group) were compared with the scores of the previous batch (control group). The focused group discussion was also carried out among the study group and responses were recorded.

Results: A significant ($p < 0.05$) improvement was observed in the score of the students during the continuous self-assessment sessions along with an increase of 46% marks in the students undergoing this program as compared to the senior batch who were not exposed to continuous self-assessment tool. The focused group discussions on the perception of the self-assessment session yielded a satisfactory response among the study group, which documented the stress levels and better performance during semester.

Conclusions: This study provided an early feedback to the learners resulting in continuous improvement by identifying their strengths, weaknesses, the learning gaps and making them self-directed learners.

Keywords: Self-directed learning, Reduced examination stress, Self-assessment, SDL

INTRODUCTION

Black and Williams (1998) stated that self-assessment by pupils, is an essential component of formative assessment. During the learning process, feedback plays an important role by helping the learner in recognition of the desired goal, evidence about present position, and some understanding of a way to close the gap between the two. In the educational scenarios, the assessment is

mainly used to measure student performance rather than a tool to promote learning. In order to facilitate learning with the use of assessment, the teachers should aim at using assessment for learning of the students.¹

According to David Carless (2007), the assessment activities (both formative and summative) are based on three core principles of learning-oriented assessment based on stimulation of thinking process, active

involvement of students in assessment criteria, quality and insight into self and peer's performance; timely feedback by the teacher to support current and future student learning. The feedback needs to be provided in a form that enables the student to judge or acknowledge their level of performance and also indicate how the students can improve.²

Self-assessment is an effective tool for providing an early feedback to the learners and hence drive the learners for continuous improvement by identifying the strengths and weaknesses of an individual and also the learning gaps; and hence the improvement in learning and performance. The ultimate goal of this tool would be continuous improvement.

The continuous improvement brought about by continuous self-assessment is based upon PDSA (Plan, Do, Study, Act) cycle; also called as Deming cycle/ Deming Wheel³. In our study, this cycle has been modified to make the CSA Cycle (Continuous self-assessment cycle) (Figure 1) could be used for explaining the role of self-assessment for continuous improvement by early recognition of learning gaps and providing a structured opportunity to assess performance and identifying the scope for improvements.

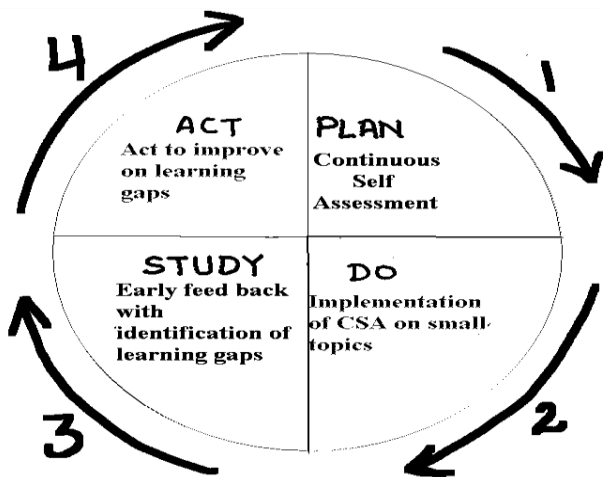


Figure 1: CSA Cycle.

Hence, the present study was designed to find out the effectiveness of continuous self-assessment sessions as a tool to improve learning among medical students in terms of early identification of the learning gaps, motivation of the students for regular learning habits, introduction of concept of continuous self-assessment, inculcating the habit of self-directed learning and reducing the stress of learning

METHODS

The study was done on 79 undergraduate medical students of admission batch 2014 (the study group). The students were taught some important topics from

cardiovascular physiology viz. cardiac cycle, cardiac output and electrocardiogram. They were subjected to weekly continuous self-assessment sessions after the regular classes.

These tests were corrected by the students themselves and they were followed by discussion in the class by the teacher. The response sheets were collected and scrutinized by the teacher and remarks were given to each student. The progress record was maintained by the teacher showing the response of the students in terms of attendance and performance. The steps involved in the preparation to conduct this programme, are discussed below:

Student counseling

Before the commencement of Continuous Self-Assessment Programme, student sensitization and counselling was done to prepare them for voluntary and whole hearted participation. It was also emphasized that the marks obtained by them in these sessions will not be counted towards any kind of formative or summative assessment. The students were motivated for active involvement and to learn to analyze their performance by themselves.

Faculty sensitization

The entire faculty in the department was sensitized about the project. The project was well accepted in the department; and planning of the time table and conduction of tests was done accordingly.

Planning for CSA sessions

The system chosen to implement the Continuous Self-Assessment (CSA) sessions was cardiovascular physiology. Two classes for cardiovascular physiology were held every week and time for weekly sessions of CSA was already allotted in the timetable. These sessions were mostly planned on Monday afternoons, as the students got time to read the topic.

The syllabus for each CSA, was fixed, as covered in the previous two classes. Hence, the course was small and fresh with the students. The topics of the cardiovascular physiology were carefully chosen to cover the entire core syllabus along with the relevant applied physiology of the topics. The blue print of the lectures was prepared; and then a small test was constructed from the core syllabus covered in the preceding two lectures.

Preparation of tests

The tests were structured as short answer type questions; mainly as one word answers/ fill in the blanks/ multiple choice questions/ diagrams. The maximum duration of these tests was up to 20 minutes. The question paper was

prepared and printed copies were distributed to all the students.

Conduction of tests

The tests were conducted in the scheduled hour, in the lecture theatre. The printed response sheets were distributed among the students. The students were supposed to write their name and roll number, on the response sheets. They were given enough time to complete their tests. The other faculty members also helped during the tests. The test was followed by discussion of the topic along with correction of the test by the students themselves. The response sheets were then collected and their marks recorded. The progress record of all the participants was maintained to see the change in their performance and attendance.

All the response sheets were individually scrutinized to track their responses and style of answering. The comments for improvement were given on the answer sheets, which were then returned to the students. The marks obtained in the test along with the discussion which followed provided immediate feedback to the student. These sessions were helpful in the improvement of their knowledge in the core syllabus; and hence their performance.

Comparing the performance of these students with students of Batch 2013 (the control group)

After the entire session for these topics was over, the marks obtained in these sessions were compared with the system chosen was taught by the same teacher in both the batches of students. The results obtained were analyzed in terms of average, Standard deviation and using unpaired t-test; along the percentage difference in performance among both the batches was calculated.

RESULTS

The marks obtained by the study batch of students during three CSA Sessions conducted on them are shown in the Figure 2, where a non-significant fall was observed in CSA II as compared to CSA I and III.

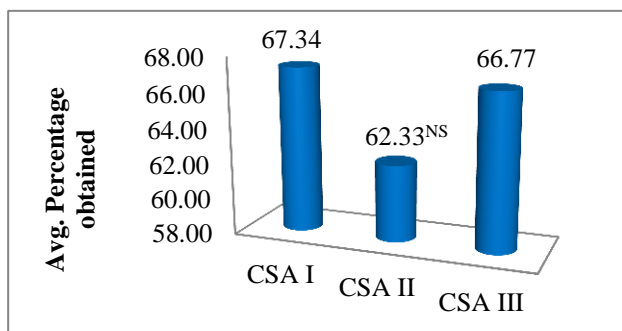


Figure 2: The comparison of average percentage obtained by the students during various CSA sessions.

The percentage marks obtained by the students undergoing CSA sessions (Batch 2014) were significantly higher ($p < 0.05$ and 0.01) than the percentage marks obtained by the previous batch (Batch 2013) in class tests, where they were taught the same system by the same teacher but CSA was not conducted on them. (Figure 3).

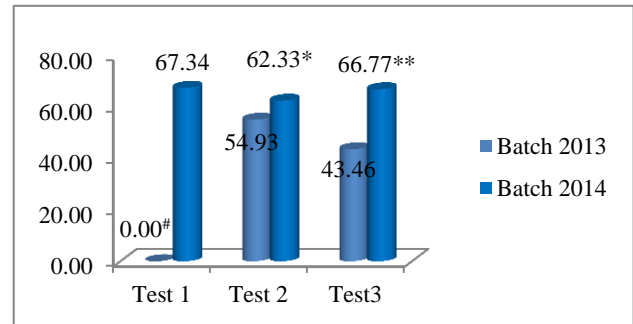


Figure 3: The comparison of average percentage obtained by the students of batch 2014 (n=79) and 2013(n=144).

Average percentage of scores obtained by the students of both the groups was compared and a significant improvement of 46% was observed in the study group. The average scores of students of study group were significantly higher ($p < 0.05$) as compared to students of control group. The results obtained from the present study show a significant ($p < 0.05$) improvement in the scores of the students undertaking the continuous self-assessment sessions as compared to their seniors, for whom the same topic was taught by the same teacher. Also, the scores of CSA show a consistently good performance by these students during those sessions.

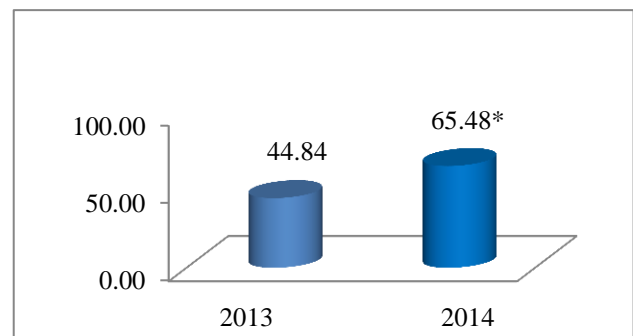


Figure 4: 46% Improvement seen in the study group (Batch 2014) as compared to the control group (Batch 2013).

DISCUSSION

In the present study, the continuous self-assessment (CSA) was used as a tool on 79 students, which helped them in improving their learning by providing them early feedback and identification of their learning gaps, which further inculcated a habit of regular self-study and

conceptual learning. The results obtained in this study also show 46% improvement in scores as compared to the senior students, which is a significant improvement in scores.

Student Feedback on CSA Session

The student feedback was taken using one on one interview and the verbatim responses recorded from the students were

- “The sessions were source of revision for us to remember what we had studied in the class”
- “It was actually very helpful, and our doubts were cleared”
- “We didn’t take the sessions seriously, as we knew; marks were not going to be added”
- “Initially we thought, extra tests are being imposed on us but eventually they were of great help”
- “It helped in improving our self-confidence”
- “Discussion was more helpful than the tests!!”
- “It could help us in preparing for competitive exams”
- “The test should contain problem based question”
- “Random surprise tests should have been more helpful in keeping us motivated for regular studies”
- “We were more confident and less stressed for cardiovascular system, as compared to the other systems during the semester examinations”

The studies have also shown that self-assessment provides a highly structured overview of strengths and weaknesses that need improvement and periodical measure of the progress. It results in early identification of learning gaps and provides conceptual framework for learning. It develops motivation, self-awareness and responsibility toward his learning and his profession. Self-assessment also prepares the students for formative and summative assessments.

The Canadian capacity building series⁶ defines self-assessment as “the process by which the student gathers information about and reflects on his or her own learning is the student’s own assessment of personal progress in knowledge, skills, processes, or attitudes. Self-assessment leads a student to a greater awareness and understanding of himself or herself as a learner.”

The planned self- assessment sessions, for students are based on reflection, meta-cognition and goal setting.^{7,8} Reflection refers to self-awareness of the learning styles where the students introspect about how their work meets the established criteria; analyze the effectiveness of their efforts and plan for improvement.

Metacognition is the learners' automatic awareness of their own knowledge and their ability to understand, control, and manipulate their own cognitive processes; goal-setting helps the learners to set appropriate goals, selecting effective learning strategies and commitment.

CONCLUSION

Hence, this study has proven the fact that structured/ planned continuous self-assessment produces the improvement in the learners in terms of self-motivation, self-directed learning and also in conceptual and sequential learning, which all together form the programmed learning. This tool could be implemented in a planned manner at the institutional level.

A complete blue print could be prepared for implementation of this programme at a large scale in all disciplines; otherwise it would tend to increase the stress rather than decreasing it. The modules could be prepared by the teachers and could be kept ready for use. The students, who wish to take up these sessions could voluntarily pick up the topics and assess themselves

ACKNOWLEDGEMENTS

The study has been carried out as the project for FAIMER fellowship under Christian Medical College, Ludhiana. Authors would like to acknowledge the support and guidance of the faculty at CMCL-FAIMER; with special gratitude to Dr. Tejinder Singh, Director of CMCL-FAIMER. Authors would also like to acknowledge the support of the faculty of Department of Physiology of my institute, in conducting this study.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Kaur M, Singh H, Badyal D. Impact of continuous self-assessment on the learning of medical students. *Int J Res Med Sci* 2016;4:2665-9.