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Introduction of Class-room quality circles among 1st year MBBS students and its effect on students learning

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Abstract:

AIM: The aim of this interventional study was to introduce classroom quality circles (QCs) among first-year MBBS students, to assess the effectiveness of QCs on learning experience of the students, and to evaluate the students' satisfaction level during the process of learning.

MATERIALS AND METHODS: A problem pool was created through a questionnaire. The study was carried out in the department of biochemistry, for a period of 6 months. Student's quality circle (SQC) group of five students was created. Then, feedbacks were collected from students by SQC after every class/topic delivered, and fortnightly meeting was held between the SQC group and faculty members of the department, and issues were brought to focus depending on these feedbacks collected by them. Possible initiatives and improvements were done on teaching-learning strategies depending on the outcome of these discussions.

RESULTS: The effectiveness of SQC group was assessed by a pre-post questionnaire (Questionnaire-3) feedback from the students and scoring was done based on 5-point Likert scale. There was a statistically significant difference ($P=0.009$) between the mean of pre-post questionnaire. To analyze the students' satisfaction level, a set of questionnaires were given to them and scoring was done. Thirty-four students agreed, 11 students were neutral, and 6 students were disagreed, that introduction of SQC was effective in solving their problems related to teaching and learning of biochemistry.

CONCLUSION: SQC creates an environment of student centric, fairness, student empowerment, improving solving skills. Implementation of student-generated feedback through introduction of SQC has improved the quality of the course as well as its delivery. It complements and supplements in achieving students intended learning outcome and hence may contribute to overall learning quality in the long run.

Keywords:

Medical education, quality circle, student's satisfaction

Introduction

With implementation of new curriculum, it has become more essential that teachers should focus on how to facilitate the students learning. It is therefore important to assess the students' perception of the various teaching learning strategies, so that necessary modifications can be made in from time to time. Moreover, students are more hesitant in giving feedback directly to faculty; rather, they are more comfortable

to express their views to their peers. In this aspect, quality circles (QCs) are designed to improve the education quality for both faculty and students through continuously focusing the attention on it. Details of the history and development of the QC are given by Ouchi in 1981^[1] According to him, the term QC (originally called quality control circles) was developed in Japan after Second World War in 1949, in which workers shared responsibility with the management in solving the problems of productivity.^[2,3] The use of this technique

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in both business and education means to share the responsibility and management between management and workers or faculty and students. As a technique of classroom assessment, QCs involve a group of students who meet regularly to identify, analyze, solve, and implement solutions to course-related problems.^[3,4] The idea of student's quality circles (SQC) came from the assumption that those who are involved in work are best people to identify defects as well suggest improvements.^[5] SQC comprises a group of students that form a "committee" (voluntary) with the objective of having quality in teaching and learning by meeting each other and also ensures the presence of the instructor regularly. Students are the leaders whereas teachers support and facilitate the whole process, challenging the "traditional power structures through collaboration." Collaborative approach and sharing of knowledge vertically as well as horizontally transform the educational institution to a learning organization.^[6]

It creates a student-centric environment where students are involved and encouraged to participate enthusiastically in their learning environment.^[7] SQCs have been very effective tools in bridging three important parameters: "quality improvement, student engagement, and the student learning experience."^[8]

This study has therefore been undertaken to assess the students' management team, i.e., SQC group on student's learning and how it improves their satisfaction level.

Materials and Methods

It was an intervention type of study. The study was carried out in the department of biochemistry, for a period of 6 months. Ethical clearance was taken before the study was initiated. All the 50 first-year MBBS students admitted in August 2019 in NEIGRIHMS were included in the study.

The study was discussed with the head of the department and other teaching staff present in the department of biochemistry.

Formation of student quality circle group

After describing concept of SQC and outlining the study, the students were asked for voluntary participation. Among them, five students were selected randomly to be the SQC group. One of the circle members was selected as a group leader.

The following ground rules were made before initiation of the study both for faculty and students:

1. Students will not be held responsible for any negative feelings on the part of their classmates that they will be asked to communicate to the faculty

2. Issues will be limited only to the Biochemistry teaching and learning.

A problem pool was created on the basis of a questionnaire (Questionnaire-1) given to all first-year medical students with the question "What problems are you facing with regard to your teaching-learning process in biochemistry?"

Based on the problem pool created by the above method, a predesigned and prevalidated questionnaire (Questionnaire-2) was prepared and feedback was taken through this questionnaire by the QC group from all the 1st year students after every class or topic of biochemistry delivered to them. A fortnightly meeting was held between the QC group and faculty members of the department, and issues and comments were brought to focus depending on feedback of the students. Possible initiatives and modifications were done on teaching-learning strategies depending on the outcome of the discussions.

To assess the effectiveness of QC group on learning experience of the students, a pre-post questionnaire (Questionnaire-3) feedback was taken from all the students. A five-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree) was used to assess the effectiveness of introduction of QC group.

A post questionnaire feedback (Questionnaire-4) was taken at the end of the study from all the students to assess their learning experience and satisfaction levels.

The data were collected in the form of questionnaire (3, 4) and put in Microsoft Excel sheet.

P value was calculated to look for the effectiveness of QC group based on pre-post questionnaire (Questionnaire-3) feedback.

Student's satisfaction level during the process of learning at the end of the study was measured using 5-point Likert scale based on postquestionnaire feedback (Questionnaire-4).

Observations and Results

All fifty students (50) admitted in August 2019 in NEIGRIHMS were included in the study.

From the problem pool created on the basis of feedback from the students present in the class, eleven different problems were identified and eight problems were selected in order of importance related to teaching-learning process of biochemistry. Based on these, Questionnaire-2 was prepared, and the QC

group used it to take feedback from the students after every class. A fortnightly meeting was held between the QC group and faculty members of the department, and issues and comments were brought to focus depending on feedback of the students. Possible initiatives and modifications were done on teaching-learning strategies depending on the outcome of the discussions.

To assess the effectiveness of QC group on learning experience of the students, a pre-post questionnaire (Questionnaire-3A and 3B, respectively) feedback was taken from all the students. A five-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree) was used to assess the effectiveness of introduction of QC group. Scores assigned to each item were used to calculate a mean \pm standard deviation (SD) score [Table 1]. The mean \pm SD score before introduction of QC was 3.547 ± 0.07 and after introduction of QC was 3.73 ± 0.12 . There was a statistically significant difference between these means ($P = 0.009$).

Figure 1a shows the quality evaluation analysis with T-L methods before and after introduction of QC.

Figure 1a shows the comparison of the effectiveness of T-L methods before and after introduction of QC. There

is 14% increase in student's number who agreed that T-L methods were satisfactory.

Figure 1b shows the comparison of the ability of students to place problems related to teaching-learning before and after introduction of QC. There is a 10% increase in number of students who agreed to it.

Figure 1c shows the comparison of satisfaction of students with the delivery content of the lecture before and after introduction of QC. There is a 22% increase in number of students who agreed to it.

Table 2 and Figure 2 show the analysis of students' satisfaction level based on five-point Likert scale. Figure 3 shows the students' satisfaction level regarding introduction of QC group and the steps taken to solve their problems related to teaching-learning process. Out of 50 students, 34 (68%) students agreed, 22% students were neutral, and 12% students were disagreed, that introduction of SQC was effective in solving their problems related to teaching and learning of biochemistry.

Discussion

The mean \pm SD score before introduction of SQC was 3.547 ± 0.07 and after introduction of SQC was 3.73 ± 0.12 .

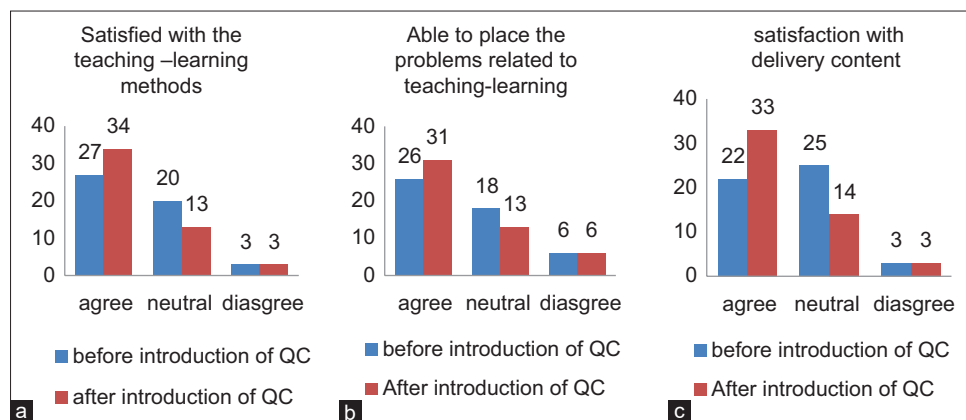


Figure 1: (a) Satisfaction with T-L methods before and after introduction of quality circle. (b) Ability to place problems related to teaching-learning before and after introduction of quality circle. (c) Satisfaction of students with the delivery content before & after introduction of quality circle

Table 1: Items and results of quality evaluation questionnaire

Items	Mean score \pm SD	
	Before introduction of QC	After introduction of QC
LOs made clear before starting the topics	3.62 \pm 0.805	3.82 \pm 0.919
Satisfaction with the delivery content	3.56 \pm 0.856	3.78 \pm 0.815
LOs were fulfilled	3.62 \pm 0.697	3.88 \pm 0.718
Motivated by the teachings, to go back and read more about that topic	3.44 \pm 0.787	3.52 \pm 0.931
Able to place my problems related to my learning before the teachers without any hesitation	3.5 \pm 0.91	3.68 \pm 0.978
Satisfied with the teaching-learning methods	3.54 \pm 0.70	3.74 \pm 0.75
Average mean score \pm SD	3.547 \pm 0.07	3.73 \pm 0.12
		$P=0.009$

QC=Quality circle, SD=Standard deviation, LOs=learning objectives

Table 2: Analysis of Students satisfaction level

Item	Students who are very satisfied (Score=5)	Students who are satisfied (Score=4)	Students who neutral (Score=3)	Students who are unsatisfied (Score=2)	Students who are very unsatisfied (Score=1)
Objectives of the class/lecture to be delivered were mentioned (%)	11 (22)	24 (44)	10 (20)	4 (8)	0
Content of the lectures were adequate (%)	8 (16)	27 (54)	14 (28)	1 (2)	0
Interaction among students and teachers were adequate (%)	5 (10)	22 (44)	20 (40)	2 (4)	0
Topic deliveries were audible (%)	4 (8)	35 (70)	9 (18)	1 (2)	1 (2)
Students were given opportunity to ask questions and clear their doubts (%)	16 (32)	22 (44)	8 (16)	4 (8)	0
Teacher summarized the entire content of the lecture (%)	10 (20)	32 (64)	7 (14)	1 (2)	0
The first internal assessment taken was aligned with the learning objectives (%)	13 (26)	33 (66)	4 (8)	0	0

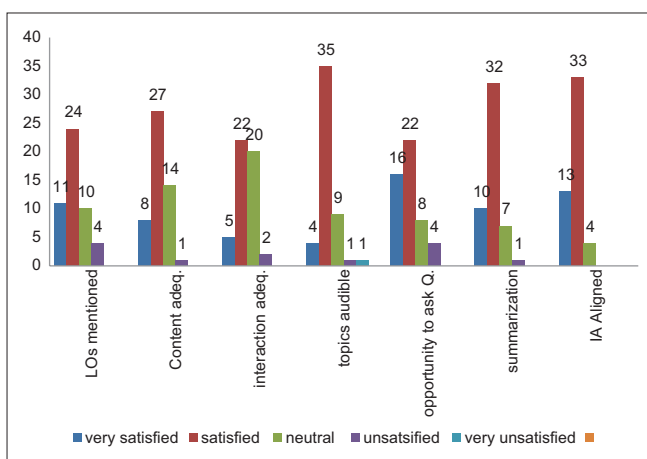


Figure 2: Bar diagram showing students satisfaction level against different items

There was a statistically significant difference between these means ($P = 0.009$). Our study results correlates well with the study done by Akturk *et al.* who found a significant improvement in various problems faced by the students. In our study, it has been observed that there is 14% increase in student's number who agreed that T-L methods were satisfactory after introduction of SQC. Along with the motivation of the students, teachers also get a strong feedback from the students through SQC which otherwise may not be possible to know the loopholes of teaching procedure and the genuine problems faced by the students. The feedbacks of the students if worked upon by the teachers can lead to a significant improvement in the whole process of teaching and learning.

In our study, it has been seen that students are more comfortable (10% increase) in placing their problems related to teaching-learning in front of teachers after introduction of SQC.

In this study, analysis of student's satisfaction level regarding introduction of QC shows that 68% students agree that introduction of SQC was effective in solving

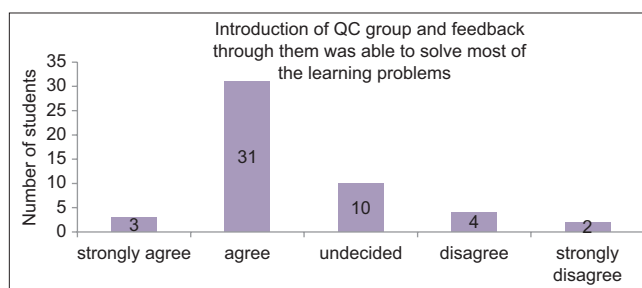


Figure 3: Bar diagram showing students satisfaction level regarding introduction of quality circle group

their problems related to teaching and learning of biochemistry. Similar findings were also found by Mohammad Rishad Farid in a study done in business administration, where there is a satisfactory increase in overall student's satisfaction level after introduction of SQC. Their students found SQC as a strong tool or platform to resolve their grievances with the facilitator.

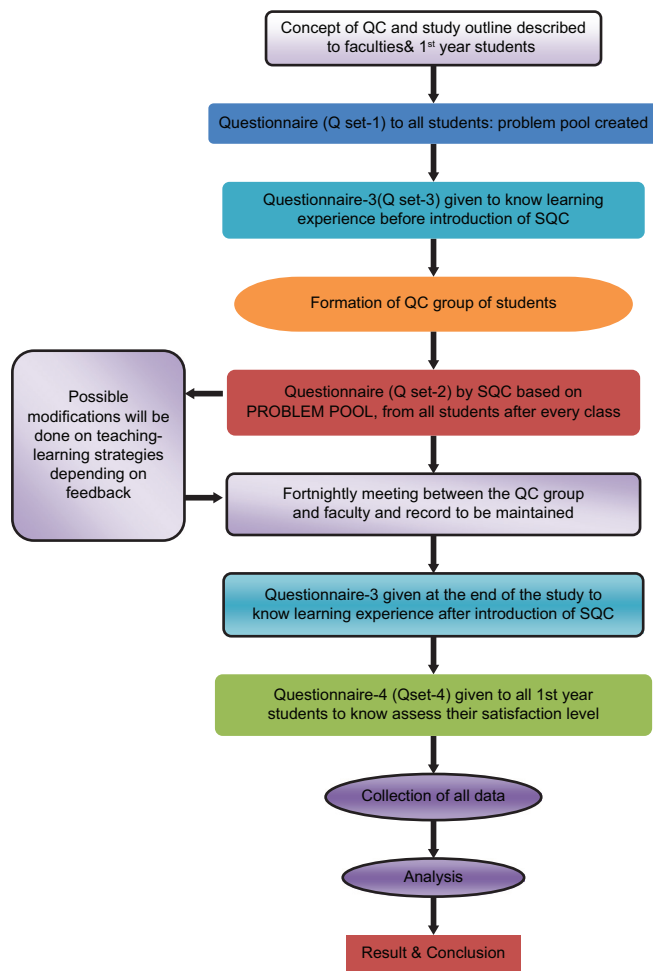
Students became more motivated and involved in their education. SQC creates an environment of student centric, fairness, student empowerment, improving solving skills. It creates a culture of coaching and mentoring among students.

In addition to the teaching team thinking about how to improve the quality of the course, the students contributed their experiences and ideas.

SQC was proved to be an effective tool in promoting and improving differentiated learning techniques of classroom.

Implementation of student-generated feedback through introduction of SQC has improved the quality of the course as well as its delivery. We believe that this may contribute to overall learning quality in the long run.

Intended learning outcome can be accomplished by better planning, formulating, assessing, and finally evaluating with the help of SQC.



Flow Chart 1: Methodology

Limitations

1. The study period was very limited. More time given to study would have revealed few results more clear
2. Initially, there was inertia among faculty to include student's feedback for their teaching quality
3. If we could have been able to involve the administration, we could have solved few more of the problems, but shortage of time and lack of fund were limiting factors.

Conclusion

The overall impact of SQC seems to improve the teaching and learning process. It acts as a bridging gap between teacher and students with the effective feedback and improves scope of learning as well adaptation of both the teacher and students to the newly implemented curriculum. SQC helps in building trust, improves communication, relationship between students and faculty. It complements and supplements in achieving students intended learning outcome and hence may contribute to overall learning quality in the long run.

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Conflicts of interest

There are no conflicts of interest.

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