

Student-led seminars as a teaching-learning method: Evidence of effectiveness of a modified format

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ABSTRACT

Objectives: To (i) modify SLS to a new, more interactive and student-centered format that would align better with the learning outcomes and (ii) assess student perceptions regarding SLS sessions.

Materials and Methods: SLS were redesigned into a presentation followed by quiz format, to make them more interactive and student-centered. The students were seated in teams during the whole session. They were assessed on their own seminar presentation as well as team performances in the quizzes after the seminars. The new format was implemented midway in Year1 of the MBBS program. Student perceptions regarding SLS sessions in the new and the old formats were surveyed using an anonymous questionnaire and scored using a Likert-like scale. Statistical significance ($p \leq 0.05$) was tested using the Wilcoxon Signed Ranked Test and the Mann-Whitney U test using PASW19 software.

Results: A significantly higher number of students in the new format of SLS responded "Seminars encourage me for self-learning", "I gained new knowledge in the seminars", "I enjoyed learning through seminars", "I understood the topic when presented by my colleagues", "I learnt new things from my colleagues in the seminar group" and "I enjoyed working with my colleagues for my seminar". The new format was significantly more interesting, interactive, fun and made them feel more like a team. Many students reported "improvement in communication skills", "learnt to make a formal scientific presentation" and "gained self-confidence after presenting the seminar".

Conclusion: Since the main use of SLS as a teaching-learning method in GMU is to inculcate self-learning, peer-learning and communication skills, the new format is significantly better at achieving the outcomes.

Key words: student-led seminars, medical education, active learning, teamwork.

INTRODUCTION

Student-led seminars (SLS) are used as a teaching-learning (T/L) method in many universities world-wide and have been used in the Gulf Medical University for many years in various undergraduate programs including the MBBS program. The discipline-based undergraduate medical curriculum at GMU was replaced by an integrated organ-system-based curriculum four years ago and SLS was adopted in the new curriculum as well. The topics identified for SLS, especially in the first year, were usually those which not only integrated across disciplines but also had an associated social awareness component along with the knowledge component. Some examples of topics earmarked for SLS are Food safety and Eating disorders, during the nutrition

course, and Health impact of disasters and Biomedical waste disposal, during the course on external and internal environment. These topics are not learnt in any other format during the course and have specific learning objectives associated with them. They offer opportunities for the students to not only integrate concepts across the different medical disciplines but also to explore beyond the textbooks and the medical field. While the learning objectives provided to the students for the SLS were related to the knowledge content of the presentation, the assessment of SLS included components of communication skills and teamwork.

Feedback is taken at the end of each course in the new integrated curriculum and it showed students in the three pre-clinical phases consistently ranked SLS

as a poor T/L method. In this context, we attempted to modify the SLS to make it more student-centered and to compare student perceptions regarding the seminar sessions in the traditional and new formats.

MATERIALS AND METHODS

Participants: Students of the first and the third year MBBS at the GMU participated in the study. The First year students participated in four SLS sessions in the traditional format and five in the new format. The perceptions of the Third year MBBS students who were not introduced to the new format were also used for comparison. Student participation in the surveys was anonymous and voluntary.

Methodology

The SLS process: Traditionally, the First year MBBS students are divided into groups (4 students each) and allotted SLS topics, dates of presentation, and the faculty facilitator, at the beginning of each academic year. The students meet the faculty facilitator and receive the learning objectives for the SLS. They then proceed to research the topic allotted to them, divide it into subtopics if necessary, and work as a team to prepare for the seminar, with guidance from the facilitator. On the day of the seminar, the group presents the topic to their peers in the lecture hall using appropriate resources such as PowerPoint presentations, whiteboard, models and video clips. Peer students attend the presentation and at the end of the seminar have opportunities to ask questions and clarify doubts. Two faculty members attend the SLS, participate in the discussions, give feedback and assess the students. A rubric is used to assess the SLS on the quality of content and the communication skills of each student. The faculty facilitator also assesses the students on their teamwork and attitudes. Marks scored in the SLS are added to the continuous assessment of each student and contribute to the summative assessment.

Need for a new format

Since SLS is an important T/L method in our integrated curriculum, we decided to study reasons for SLS being rated as a poor T/L method by the students. Focus group discussions were conducted with the first, second and third year students and some areas of concern were identified. While the learning objectives provided to the students were clear regarding the content, the students were not aware that SLS played an important role in acquiring skills related to self-learning and communication. Further, the students while presenting the SLS viewed it as an activity aimed mainly at satisfying the facilitator and the assessing faculty, where they gain the marks associated with it. The students attending the SLS, additionally, did not view it as being any different from a lecture and did not find it interesting or interactive. Further, there was no incentive to participate actively during the sessions.

The new SLS

The new format of the SLS was introduced midway in the 2011/12 academic year of the first year students after five SLS sessions had already been conducted in the traditional format. As shown in Figure 1, there was no change in the topics, groups or facilitators for the seminars. In order to encourage active learning, make the sessions more interactive and provide an incentive to participate in the sessions, changes were introduced. The students were given the learning objectives of the SLS in advance, and given time to study and come prepared for the SLS. They were informed about the quiz to be conducted at the end of each seminar. The student groups (the same as the seminar groups) were seated in teams, as shown in Figure 2 during the SLS presentations. The students presented the seminar as they had done previously. At the end of the presentation, time and opportunity were given for questions and clarification of doubts. This was followed by an oral quiz conducted by the seminar facilitator. The student teams answered questions and were scored based on their performance. The format of faculty assessment of the SLS remained unchanged.

Traditional SLS format

New SLS Format

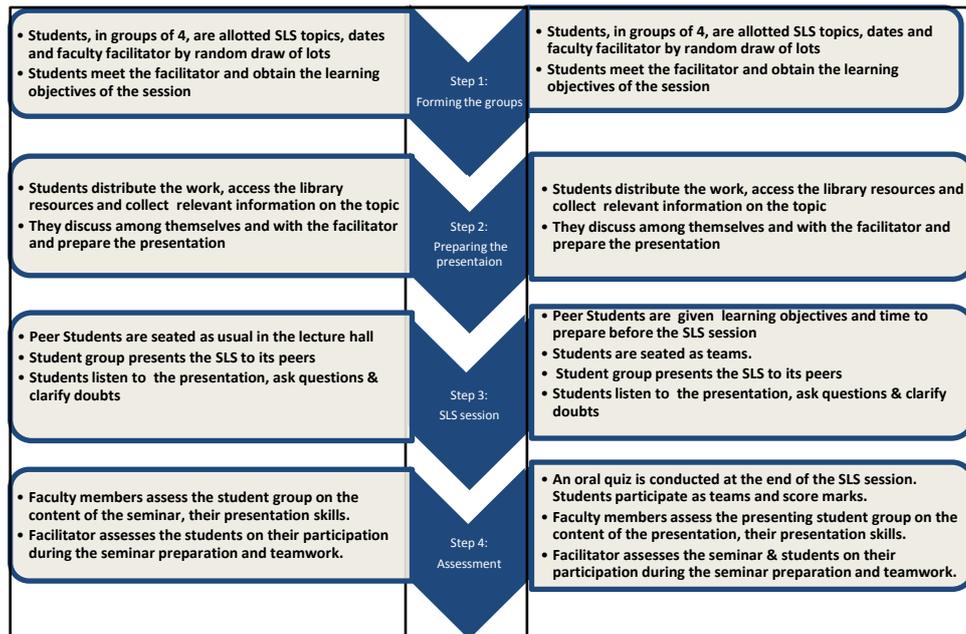


Figure 1. Flow chart of the SLS process in the traditional and the new formats

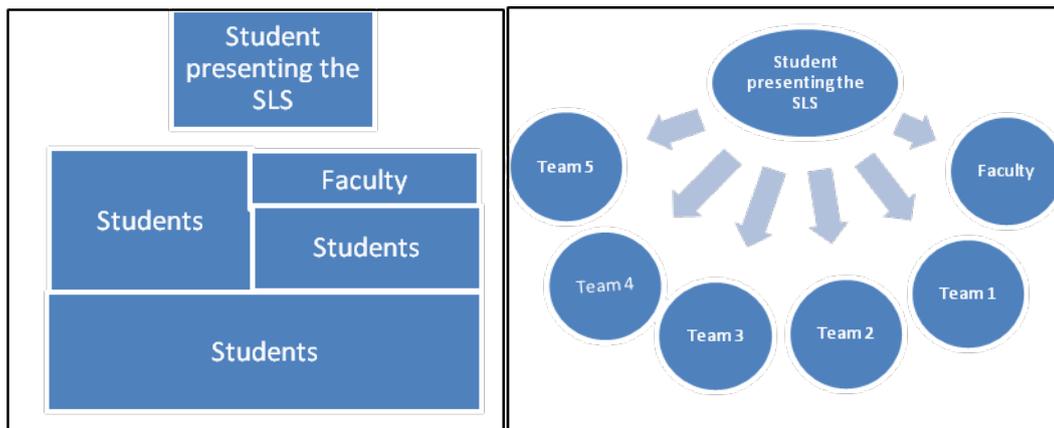


Figure 2: Graphic representation of the seating during SLS. Left: Traditional format; Right: New format

The quiz

Question numbers were allotted to the student groups by draw of lots. The questions were projected on the screen one at a time. Teams with the corresponding number were given one minute to discuss among themselves and come up with the answer. If the answer was correct, 1 mark was awarded. If team got it wrong, the question passed on to the next team who got an opportunity to answer and score marks. The correct answer was also displayed on the screen later. Marks scored by each team were

entered into a table. The marks scored in the quizzes were added to the marks scored by the student in his/her own SLS presentation for the purpose of summative assessment.

Student perceptions of SLS sessions

In order to assess student perceptions regarding the sessions, surveys were conducted using a questionnaire. The questionnaire was designed with the help of other faculty members involved in the program, validated and pilot tested on three students before administering it to the students. Student responses

were anonymous. Students were asked to respond to closed ended questions on a five point Likert-like scale ranging from Strongly Disagree (1), Disagree (2), Uncertain (3), Agree (4) to Strongly Agree (5). Data was entered into the SPSS 19 software. Difference in mean score was tested using the Wilcoxon Signed Ranked Test for the First Year students regarding the traditional SLS and the new SLS formats. A p value less than 0.05 was considered statistically significant. Perceptions regarding effectiveness of the SLS sessions were also surveyed using another anonymous questionnaire given the students in the third year (traditional SLS format) and the first year (after seven sessions in the new SLS format). Mann-Whitney U test was used to test for significance between the two groups.

RESULTS

It was observed that the new seating arrangement (Figure 2) helped to bring in a feeling of being in teams and was a

change from the usual lecture format. As can be seen from mean scores in Figure 3, a significant difference exists in the number of students reporting “feel like a team member” (3.49 vs. 4.15). Seminars became significantly more “interesting” (3.29 vs. 3.97), “fun” (3.08 vs. 3.83) and “interactive” (2.9 vs. 3.95). Fewer students find them “boring” or a “waste of time”. Since the pre-clinical medical curriculum is usually very knowledge-intensive, there is very little opportunity to have fun during the learning process and the new format of SLS appears to have satisfied this need. While the new SLS appears to be significantly more “challenging” students do not appear to find it any more “stressful”. Though SLS has always had marks associated with it, significantly more students appear to feel that the new SLS gives them “an opportunity to score marks”(2.6 vs. 4.45), probably due to the additional chances during the quiz.

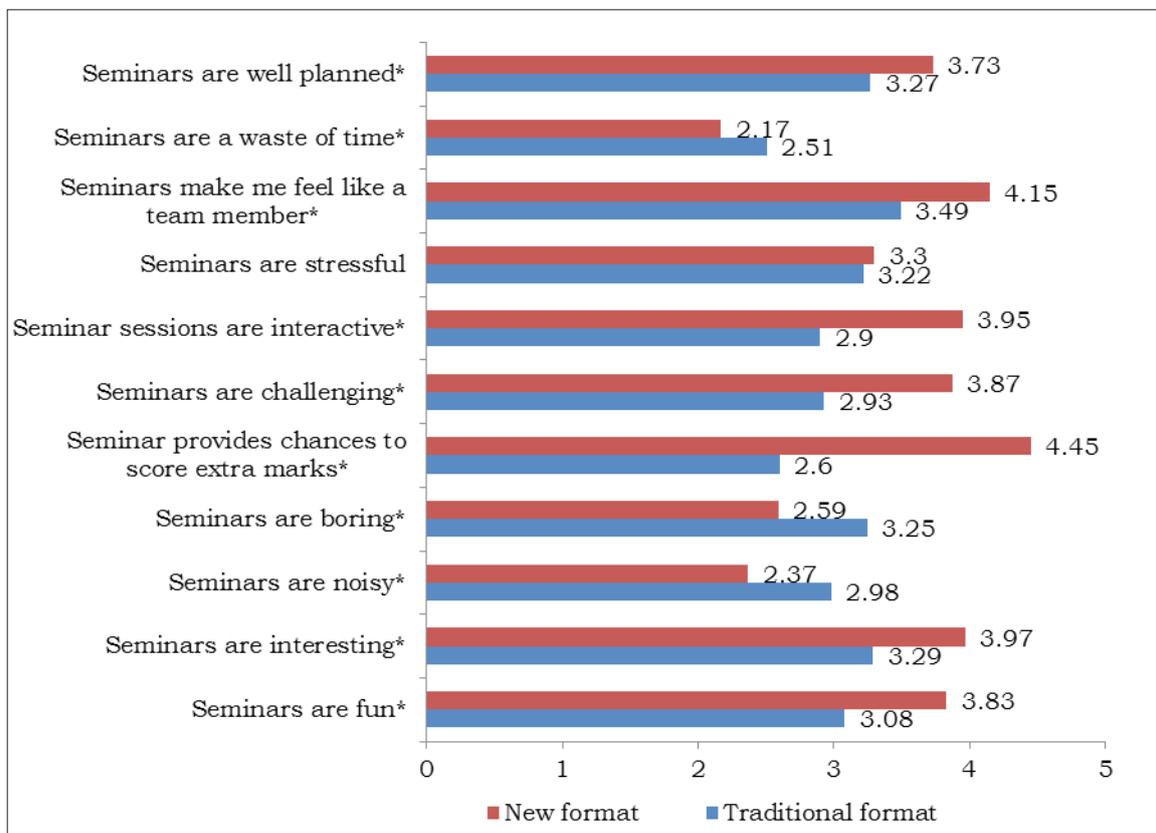


Figure 3. Comparison of the perceptions regarding SLS in the traditional format and the new format. Values shown are mean scores on the likert-like scale. *Significant difference (p ≤ 0.05) between the median scores of the two formats tested using the Wilcoxon signed rank test.

Student perceptions regarding SLS were also compared between students in the traditional format (third year) and those in the new format (first year) towards the end of the academic year. As shown by the scores in Table 1, a significantly higher number of students in the new format reported being “encouraged for self-learning”, “gained new knowledge” and “gained general knowledge”. More students in the new format enjoyed learning through seminars and found them interactive and fewer students found them boring which suggests active learning. A higher numbers of students reported learning new things from peer students in their seminar group and enjoying working with their colleagues,

suggesting that increased peer-learning and teamwork was taking place in the new format. While fewer students reported “hardly worked together” in the new format, the difference was not significant. More students in the traditional format than in the new format felt that they could have learnt the topic on their own, without attending the seminars, but this could also be due to the fact that the third year students are more mature and able to learn on their own. Student perceptions regarding communication skills such as “improved my communication skills”, “know how to make a formal scientific presentation” and “gained self-confidence” are high in both formats.

Table 1: Comparison of student perceptions regarding SLS between Year3 (Traditional format) and Year1 (New format). Scoring was done using a likert-like scale ranging from 1 to 5, with 1- strongly disagree to 5-strongly agree. Significance was tested between the median scores using the independent- samples Mann-Whitney U test ($p \leq 0.05$).

Item #	Statements	Median (Mean)scores	
		New format (Year 1) n=63	Traditional format (Year 3) n=42
1	Seminars encourage me for self-learning	4.0 (3.79) *	3.0 (2.98)
2	I gained new knowledge in the seminars	4.0 (4.10) *	3.0 (3.12)
3	I enjoy learning through seminars	4.0 (3.52) *	2.0 (2.55)
4	Seminars are interactive	4.0 (3.79) *	3.0 (2.71)
5	I understand a topic when presented as a seminar by my colleagues	3.0 (3.40) *	3.0 (2.57)
6	<i>I could have learnt the topics on my own without attending the seminars¹</i>	3.0 (3.06) *	4.0 (3.52)
7	Seminars increased my general knowledge	4.0 (3.87) *	3.0 (2.83)
8	<i>Seminars are boring¹</i>	3.0 (3.13) *	4.0 (3.71)
9	I learnt new things from my colleagues in my seminar group	4.0 (4.06) *	3.0 (3.24)
10	<i>We hardly worked together in preparing or presenting our seminar¹</i>	2.0 (2.87)	3.0 (3.05)
11	I enjoyed working with my colleagues in my seminar	4.0 (4.06) *	3.0 (3.22)
12	I learnt how to work as a team during our seminar	4.0 (4.08)	4.0 (3.69)
13	Presenting the seminar has improved my communication skills	4.0 (4.11) *	4.0 (3.76)
14	I now know how to make a formal scientific presentation	4.0 (4.14) *	4.0 (3.71)
15	I have gained self-confidence after presenting my seminar	4.0 (4.03)	4.0 (3.93)

¹Negatively worded statements; *Significant difference between Year 1 and Year 3

DISCUSSION

The main outcomes of SLS as a T/L method in our curriculum, especially in the pre-clinical phase, are to foster integrated learning and to develop generic and transferable skills of life-long learning and communication. Students are expected to develop competencies in information retrieval from various sources, distinguish between reliable and unreliable sources of information, understand and organize the information logically and scientifically; and communicate it effectively to peers using available information technology tools. Since the students work in groups, they are also expected to develop teamwork skills.

Since the topics for the SLS are carefully selected and based on the learning outcomes from the different courses in Phase I of the undergraduate medical curriculum, the same topics were retained for the new format. All changes made dealt with the actual classroom activities during the SLS sessions. The new seating arrangement in the classroom during the SLS and the participation as teams appear to have increased their sense of belonging to a team. Seating arrangements have been reported to make a significant difference, and sitting in the high interaction zone has been reported to be associated with higher performance and inversely correlated with the percentage of absences in a recent study¹. The new SLS was found to be more interactive, interesting and fun, contributing to active learning. This was expected and similar results have been reported in a study where student seminars were used to stimulate active learning in a metabolic biochemistry course with good success². The feeling of being in a team is also reinforced by the fact that during the quiz the students consult each other before answering the questions. Since the team size is small (four students make up a team), the lack of effort by any member becomes obvious and there is pressure on each student to contribute, which in turn makes the student participate actively. This would explain the perception that seminars are

more challenging. A study which used team-based learning and peer learning in Physiology reported that the peer teaching approach with seminars by students was received enthusiastically by medical students³. Factors affecting learning in seminars were reported to be very similar to those associated with other small group sessions, as was observed in a study where seminars were held in groups of 25 students. Focus groups conducted with the students in that study revealed that the number and type of seminar questions and the amount and clarity of the preparation materials affected learning through seminars. Also, the facilitating methods used by the teachers, the group composition, size and atmosphere, the amount of active student participation, interaction and assessment all influenced seminar learning, according to students⁴. Peer and near-peer teaching has been shown to be very effective in improving knowledge acquisition and retention by medical student⁵. It has also been suggested that medical students may become more effective communicators as a result of such training, as teaching is an essential aspect of physician-patient interaction and that medical students with a better understanding of teaching and learning principles may also become better learners⁶.

Teamwork is being increasingly emphasized in healthcare practice and is associated with improved quality of care and reduced errors. Team training is therefore essential in medical education and ways for better team training have also been suggested^{7,8}. Though our study subjects were only in the first year of medical education, we feel it is never too early to learn generic teamwork skills and that students should be encouraged to work as teams for their seminars and other activities whenever possible. It is encouraging to note that more students in the new format enjoyed working together, learnt from each other and felt that they had learnt to work as a team.

Communication skills are very important for any healthcare practitioner and opportunities to learn them need to be

embedded longitudinally during health-professions education^{9,10}. An important learning outcome of the integrated medical curriculum is the development of communication skills. Medical students undergo a three-week communication skills course at the beginning of the first year. The concepts learnt are reinforced during each of the SLS sessions through the year. Student perceptions regarding communication skills show SLS is very effective in this regard and large numbers of students in both formats reported an improvement in communication skills and self-confidence. Similar perceptions are reported in a study where student presentations in the form of CPC exercises in the undergraduate medical curriculum were found to give students an opportunity to apply communication, informatics, research and critical thinking skills in a preclinical basic science course¹¹.

CONCLUSION

The new format of the SLS seems to be significantly better in encouraging students for self- and active learning since it is perceived as more enjoyable. Student perceptions regarding peer-learning, teamwork and communications skills are also better in the new format.

LIMITATIONS OF THE STUDY

All results and conclusions are based on student perceptions as gathered from surveys. Student samples taken were not equivalent since they were at different times in the medical curriculum. The impact of the new SLS format on gain in knowledge as evidenced by scores in examinations was not studied. The student feedback on seminars as a T/L method for the entire year is still awaited.

RECOMMENDATIONS

The new format of SLS can be tried out in other courses and programs since

all outcomes addressed are generic in nature.

ACKNOWLEDGMENTS

We thank the students for participating in the focus groups as well as in the surveys.

REFERENCES

1. Zomorodian K, Parva M, Ahrari I, et al. The effect of seating preferences of the medical students on educational achievement 2012. doi: 10.3402/meo.v17i0.10448.
2. Sé AB, Passos RM, Ono AH, et al. The use of multiple tools for teaching medical biochemistry. *Advances in Physiology Education* 2008;32(1):38-46.
3. Gary L. Anderson JCP, William B, et al. Falcone, Richard W. Stremel & Dale A. Schuschke. Using "Active Learning" Methods to Teach Physiology. *Journal of the International Association of Medical Science Educators* 2011;21(1):8-20.
4. Spruijt A, Jaarsma ADC, Wolfhagen HAP, et al. Students' perceptions of aspects affecting seminar learning. *Medical Teacher* 2012;34(2):129-35.
5. Peets A, Coderre S, Wright B, et al. Involvement in teaching improves learning in medical students: a randomized cross-over study. *BMC Medical Education* 2009;9(1):55.
6. Dandavino M, Snell L, Wiseman J. Why medical students should learn how to teach. *Medical Teacher* 2007;29(6):558-65.
7. Thomas EJ. Improving teamwork in healthcare: current approaches and the path forward. *BMJ Quality & Safety* 2011;20(8):647-50.
8. Lerner S, Magrane D, Friedman E. Teaching Teamwork in Medical Education. *Mount Sinai Journal of Medicine: A Journal of Translational and Personalized Medicine* 2009;76(4):318-29.
9. Association of American Medical Colleges. *Recommendations For Clinical Skills Curricula For Undergraduate Medical Education* 2008.
10. Von Fragstein M, Silverman J, Cushing A, et al. UK consensus statement on the content of communication curricula in undergraduate medical education. *Medical Education* 2008;42(11):1100-7.
11. Klatt EC. Student Clinical Pathologic Correlation Presentations. *Journal of the International Association of Medical Science Educators* 2009;19(4):150-4.