Peer Assisted Learning in a Large Class Format

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**Abstract**

**Introduction:** Most of the research around peer assisted learning (PAL) has been directed towards the contribution of PAL in small groups for both knowledge and skill gains. Although PAL has been used for didactic sessions like lectures or presentations in tutorials, the dynamics of PAL in these sessions are not well researched. We therefore designed this study to explore the acceptance and perceived usefulness of didactic PAL sessions in a large class format.

**Method:** Peer assisted learning was incorporated in a Urology module for 4th year MBBS students. Students were assigned topics in groups to prepare and present in front of the whole class. The presentations were followed by question answer sessions by students in the presence of the teacher. The teacher summed up the session at the end.

The perception of students was assessed using an electronically distributed questionnaire regarding acceptance and usefulness of PAL. The usefulness was also assessed by rating student presentations for content, explanation of concepts, and number of questions asked by the peers. A focus group (FGD) was also conducted to explore student perceptions on engagement in this didactic large class PAL in depth.

**Results:** Seventy-three students participated in the survey (Response Rate = 73.7%). Students were neutral for both acceptability (Mean= 3.08, SD= 0.72) and usefulness (Mean= 3.20, SD= 0.54) of PAL in the given setting. Only 25% of students demonstrated content adequacy in their primary effort for presentation, 10% explained all concepts, 40% explained at least major concepts while 40% just read the slides. Students asked more questions from peer tutors than teachers (Mean= 1.14, SD= 0.80 vs 1.75, SD= 0.89, p < 0.05). Majority of the students agreed that they found the teacher review on their presentation as most useful (84.9%), followed by the group work involved (75.3%).

Analysis of the descriptive questions and FGD identified both positive and negative aspects of PAL sessions. Several themes are discussed in each category.

**Conclusion:** Didactic PAL is acceptable and useful in large class format although it loses some of its advantages.
Teacher feedback and background collaborative learning remain the most valued aspects of this format.

**Keywords:** Peer assisted learning, Peer didactic sessions, Large class format

**Introduction**

Peer assisted learning (PAL) has been growing globally as a formal learning and teaching strategy in undergraduate medical education (Benè & Bergus, 2014; Williams & Reddy, 2016). Although many systematic reviews fail to highlight any clear knowledge or skill acquisition differences between students who get peer-taught or not, the main benefits are drawn from the process of teaching and social and cognitive congruence that exists between students and their peer teachers (Irvine, Williams, & McKenna, 2016; Rees et al, 2016; Topping, 1996). In addition, it can relieve faculty from some of its teaching burden and can be of value in situations where faculty number is already constrained (Burgess, McGregor & Mellis, 2014; Rees et al, 2016). Despite these advantages, it is still used sporadically as a formal teaching tool in the developing world (Abedini et al, 2013; Manzoor, 2014), in contrast to the US where its use has been reported to be in 100% of the medical schools (Soriano et al, 2010).

Number of students in a learning group is crucial because it effects likelihood of engagement of students in a given activity and thus impacts overall learning that the students perceive to achieve. Moreover, perception of students about the value of peer discussion is also directly related to group function (Eddy et al, 2015) which in turn is affected by the number of students in a group. Students also seem to experience less anxiety in small group discussions than in whole class discussions (Eddy et al, 2015). There is also some evidence that students appreciate small group sessions more than lectures even when both sessions are led by peers (Gandhi et al, 2013). For these reasons, it is logical to assume that the dynamics of peer group learning should be different in a large class format.

Since most of the research on PAL is also being done in the developed world, the focus has been on its use in integrated, competency based medical curricula (Rees et al, 2016). Therefore, most of the research revolves around its acceptance and usefulness for knowledge or skill acquisition in small group settings (Topping, 1996; Castle et al, 2014; Ahsin et al, 2015; Gandhi et al, 2013; Gottlieb, Epstein, & Richards, 2017; Lin et al, 2017). Similarly, lectures led by teachers have been compared with PAL done in smaller groups (Manzoor, 2014; Abedini et al, 2013; Daud & Ali, 2014). Because of the dissimilarity of the groups it is difficult to assert that PAL was solely responsible for success of small group sessions in these comparisons.

As lecturing remains the main method of curriculum delivery in our setup due to resource constraints, we incorporated didactic PAL sessions to ensure students’ active engagement in lectures, in addition to improving their presentation skills and enhancing meaningful student teacher relationship. Because of lack of studies with large groups of students, we designed this study to learn about the dynamics, acceptance and usefulness of didactic PAL in our setup.

**Method**

Peer assisted learning was incorporated in Urology module in 4th year MBBS. This 4 weeks duration module consists of around 60 hours of teaching out of which 28 hours of teaching on the topics on the subject of Urology was handled by a single faculty member (subject specialist) in lectures. PAL sessions were mandatory for all students and were part of the core curriculum. Though our students have exposure to working in small group discussions & PBLs, formal PAL is not incorporated in our curriculum in any other format and students experienced it for the first
time in this module.

Students were asked to form groups of 3 to 4 with peers of their choice. Each group was asked to choose a topic to prepare and present in front of the class in 20-30 minutes. Module guides provided to the students contained learning objectives for each session. The teacher reviewed the initial draft of the presentation to verify adequacy of the content and to provide support for any needed learning resources or shortcomings. Final version of the presentation was always approved by the teacher prior to the session. Peer tutors then presented the topic in front of the class and answered questions raised by the tutees. It was left to the students to choose whether one or more members of the group presented. The teacher at the end summed up the session with his own presentation, highlighting important concepts, and clarifying any ambiguities as deemed necessary in addition to providing feedback to students.

The perception of students regarding acceptance and usefulness of PAL was assessed at the end of the module using an electronically distributed questionnaire. The survey questionnaire consisted of 17 questions for the two subscales acceptability and usefulness as depicted in appendix. These were ranked on a scale of 1 to 5 where 1 represented strongly disagree and 5, strongly agree. In addition, three descriptive questions were also asked regarding advantages, disadvantages, and any suggestions for improvement.

The usefulness was also assessed by rating student presentations for content as presented in the first draft by the group (inadequate, adequate, more than required) and explanation of concepts (read through the slides, explained one or two major concepts, explained almost all of the concepts) by the teacher. Number of questions asked by the students from their peer tutors and teacher were also noted at the end of each session.

A focus group discussion (FGD) was conducted with 10 students after the survey results were available to further understand students' descriptive responses in the survey. Student participation in FGD was voluntary. Both authors coded the descriptive part of the survey and identified themes independently. Positive and negative aspects of the method (PAL) were classified separately. These themes were explored in the FGD for a better understanding.

Ethical approval for the study was obtained from the Ethics Review Committee (ERC) of Islamic International Medical College (Reference number - Riphah/IIMC/ERC/17/0223). Verbal consent was obtained from students for participation in the survey and focus group discussions which were voluntary.

### Results

Total number of students participating in the study was 99 out of which 70% were female. Seventy-three students responded to the survey (Response Rate = 73.7%). The Cronbach’s alpha coefficients for both subscales were above 0.7 indicating good internal consistency. (Table 1)

| Subscale      | Alpha coefficients | No. of items |
|---------------|--------------------|--------------|
| Acceptability | 0.86               | 8            |
| Usefulness    | 0.79               | 9            |
Students were neutral for both acceptability (Mean= 3.08, SD= 0.72) and usefulness (Mean= 3.20, SD= 0.54) of PAL in the given setting. Although a majority (65.7%) was overall satisfied with PAL in lectures, around 93% still considered teacher lectures necessary. (Table 2) Majority of the students agreed that they found the teacher feedback on their presentation as most useful (84.9%), followed by the group work involved (75.3%). 61.7% considered that it was useful only for the topic that they prepared and only 50.7% considered it useful from assessment point of view.

| Subscale         | Item                                      | Strongly Disagree (%) | Disagree (%) | Neither agree nor disagree (%) | Agree (%) | Strongly Agree (%) | Mean Score (1-5) |
|------------------|-------------------------------------------|-----------------------|--------------|--------------------------------|-----------|--------------------|-----------------|
| Acceptability    | liked the peer teaching component         | 1.4                   | 11           | 16.4                           | 57.5      | 13.7               | 3.71            |
|                  | Overall, I am satisfied...                | 4.1                   | 19.2         | 11                             | 58.9      | 6.8                | 3.45            |
|                  | more comfortable in asking questions from my peer | 13.7             | 37.0         | 15.1                           | 28.8      | 5.5                | 2.75            |
|                  | could learn better without this           | 1.4                   | 28.8         | 38.4                           | 21.9      | 9.6                | 3.10            |
|                  | Teacher lecture is necessary               | 1.4                   | 2.7          | 2.7                            | 30.1      | 63.0               | 4.51            |
|                  | just a waste of time.                     | 6.8                   | 54.8         | 12.3                           | 19.2      | 6.8                | 2.64            |
|                  | enjoyed the group work                    | 4.1                   | 13.7         | 16.4                           | 52.1      | 13.7               | 3.58            |
|                  | I don’t understand why PAL is placed       | 12.3                  | 41.1         | 26.0                           | 13.7      | 6.8                | 2.62            |
| Usefulness       | peer learning more effective than routine teacher led lectures | 5.5                   | 35.6         | 20.5                           | 28.8      | 9.6                | 3.01            |
|                  | did not find it useful for final preparation of exams | 4.1                   | 46.6         | 12.3                           | 27.4      | 9.6                | 2.92            |
|                  | The topics taught by my peers were more easily understandable. | 2.7                   | 31.5         | 17.8                           | 46.6      | 1.4                | 3.12            |
|                  | Preparing presentations is too time intensive. | 4.1                   | 34.2         | 11.0                           | 42.5      | 8.2                | 3.16            |
|                  | peer’s presentations covered all the important aspects of topics | 4.1                   | 17.8         | 6.8                            | 64.4      | 6.8                | 3.52            |
|                  | generally useful only for the topic for which I prepared. | 1.4                   | 23.3         | 13.7                           | 46.6      | 15.1               | 3.51            |
|                  | teacher review on my presentation provided me with useful feedback | 1.4                   | 1.4          | 12.3                           | 53.4      | 31.5               | 4.12            |
|                  | learned a lot from the group work involved in making presentations | 1.4                   | 8.2          | 15.1                           | 63.0      | 12.3               | 3.77            |
|                  | In my group everyone collaborated in preparing the topic for presentation | 6.8                   | 9.6          | 5.5                            | 65.8      | 12.3               | 3.67            |
Only 25% of students demonstrated content adequacy in their primary effort for presentation. Regarding explanation of concepts in class during presentation, 10% explained all concepts, 40% explained at least major concepts while 40% just read through the slides. Students asked more questions from their peer tutors as compared to the teacher (Mean = 1.75, SD = 0.887 vs 1.14, SD = 0.803, p < 0.05).

The themes identified in the qualitative analysis are detailed in Table 3 & 4.

Table 3
(a) Positive aspects of the peer learning experience

| Theme                     | Verbatim                                                                 |
|---------------------------|--------------------------------------------------------------------------|
| Collaborative learning    | “Helped me to improve any skills a learning methodology by looking at others’ skills.” |
|                           | “It teaches students to work better in a group which is also going to be important later in our careers.” |
| Acquisition of teaching skills | “It provides us an opportunity to develop skills like Leadership, Teamwork and Communication.” |
|                           | “……….. is only for polishing our presentation skills.” |
| Deep learning             | “We are really able to understand and learn the topic assigned to us in depth.” |

Table 4
(b) Negative aspects of the peer learning experience

| Theme                                | Verbatim                                                                 |
|--------------------------------------|--------------------------------------------------------------------------|
| Lack of teaching authenticity        | “students can’t teach the way a teacher can ….”                           |
|                                      | “peer teachers have read the same books we have so what’s the difference ….” |
|                                      | “teachers have personal experience so they can explain better and can give real life examples ….” |
|                                      | “teachers make assessment so they know what’s important for us to know from exam point of view.” |
|                                      | “teachers have got experience which peer tutors don’t have …”             |
|                                      | “we don’t take class fellows seriously ….”                               |
| Lack of teaching skills              | “some students just read slides and did it because it was compulsory.”    |
|                                      | “… but if peer to deliver lecture is just going thorough reading slides and just passing time then it becomes useless until teacher also deliver lecture later …” |
|                                      | “there is so much pressure on one person to deliver in front of whole class.” |
|                                      | “maybe I can explain to 3 or 4 students but in front of whole class I couldn’t do it” |
| Cultural and social factors          | “questioning is not really encouraged in our culture.”                    |
|                                      | “the topics were awkward for mixed gender discussions.”                   |
|                                      | “there are all kind of students in class, some have negative attitude ….” |
| Sense of camaraderie                 | “peer tutors can get easily confused themselves if we ask too many questions so it’s better not to do that with fellows ….” |
Discussion

PAL has been well accepted as a teaching method in medical education and is increasingly being employed formally in undergraduate education (Ross & Cameron, 2007; Thistlethwaite, 2017). In addition to its importance in preparing medical teachers for tomorrow, it promotes active and deep learning by the students in an autonomous, comfortable and safe environment and is considered beneficial for both the peer teacher and the learner (Benè & Bergus, 2014; Rees et al, 2016; Gottlieb, Epstein & Richards, 2017). Although didactic teaching by peers in large groups is not new but there has been no definite consensus in the literature about the number of students that constitutes a large group. Olaussen et al (2016) classified such sessions as peer didactic if the number of students exceeded 10. However regardless of number of students, sessions in which one peer presents in front of a group or class, have also been termed as peer teaching conference (Kernan et al, 2005) and group tutoring (Topping, 1996) in literature. Not all studies report the number of students in these sessions (Kernan et al, 2005; Topping, 1996) and where reported it is highly variable from as small as 12 to up to 40 (Topping, 1996; Daud & Ali, 2014). Majority of these studies have positive subjective evaluations but vary in their settings and execution thus making it difficult to decide what works best in a very large group setting like ours’.

Our study shows that although a decent majority (65.7%) was satisfied with the method, students were neutral for overall acceptability of PAL (Mean= 3.08, SD= 0.72) because a large number (38.4%) was unsure whether they could learn better with this method or not and 50% were not comfortable in asking questions from their peers. Moreover 93.3% considered teacher lecture necessary anyway.

Similarly, although majority of students agreed that they learned a lot from teacher's review on their presentations (84.9%) and group work involved in making presentations (75.3%), the overall score on usefulness remained neutral (Mean= 3.20, SD= 0.54) because many students were rather skeptic over its usefulness as compared to teacher led lectures (61.6%), considered it time intensive (50.7%) or considered it useful for only the topic they prepared for (61.7%). One of the reasons for this response could be that teaching in very large groups is different, and students are not adept enough with skills required to successfully carry out these sessions. FGD also revealed that peer tutors struggled dealing with such a large number of tutees and most of them found it difficult to explain in front of the whole class. These factors probably decrease the acceptability and usefulness of this method as compared to other studies where > 80% students appreciated it (Castle et al, 2014; Gottlieb, Epstein, & Richards, 2017).

There is much evidence that students value the informal interaction and comfortable environment of PAL groups and it has been claimed that social and cognitive congruence play an important role in the success of PAL (Topping,1996; Gottlieb, Epstein, & Richards, 2017). Although De Volder et al in 1985 compared tutor led with student led PBLs and concluded that they could not find evidence for congruence theory in their study (De Volder, De Grave & Gijselaers, 1985), majority of the studies (especially those with qualitative evidence) suggest these factors to be functional at least in small groups. Since the information processing structures are similar in the peer tutor and the learner, we assumed that this cognitive congruence should result in peer tutors identifying the knowledge gap more accurately and filling it more comprehensively and in novel ways that a teacher can't do because of the larger knowledge difference. This should result in novel ways to present the material and explain it in class. However, our results clearly show that only a minority could do it. Majority students tended to follow the standard content and explain it in ways similar to the teacher. 40% of our students did not explain the material at all and just read the slides. There is evidence elsewhere as well that students seem to experience more anxiety in whole class discussions as compared to small group discussions and this factor is disproportionately higher for female students in whole class discussions (Eddy et al, 2015). Since majority of our students was female, this could explain some of the anxiety towards whole class PAL. FGD also revealed that students as tutors struggled with explanations.
mostly sticking to run of the mill material in class. Some of them said that they could explain in front of a few students but not in front of the whole class. As tutees, they were rather skeptical of explanations provided by their peers and considered the "knowledge gap" and clinical experience of the teacher as unmatchable by peer tutors.

Social role theory suggests that students learn better from their peers because of same age and social status and are more open to them in presenting, discussing, and clarifying their queries (Topping, 1996). This suggests that students should ask more questions from their peers as compared to the teacher and should be more relaxed in PAL sessions. Although 50% of our students agreed that they were not comfortable in asking questions from their peers in whole class in the survey, statistically significant more questions were asked from peer tutors as compared to the teacher which supports the social role theory. However, in the FGD our students confessed that they were hesitant to ask questions from their peer tutors in class not only because of a sense of camaraderie (not to put your friends in trouble in front of the whole class) but also due to lack of a "culture of questioning" in our education system. They also pointed towards some cultural and social factors that affected their openness in class for example they considered some of the topics "awkward for discussion in our set up" in a mixed gender class. Thus, one can conclude that social interaction does alter in a large class and a very large number of students also present unique managerial issues for the novice peer tutors. Therefore, large group sessions do lose some of the benefits of small group PAL due to changed dynamics.

Presence of teacher in class is another factor which can alter student interaction (Rees et al, 2016). At the same time, it also provides support to the shy students who find it difficult to explain concepts or answer questions and keep order in class (Rees et al, 2016). In another study 92.3% students found it helpful to have a faculty member present during co-teaching (Gottlieb, Epstein, & Richards, 2017). Teacher supervision also seems necessary to ensure a minimum standard for the delivered content as 75% of our students required guidance to improve upon their content. Although the extent to which this guidance is needed can vary under different circumstances, as another study reported peer teacher material as good or above for 57% of students (Kernan et al, 2005). In addition to keeping an eye on material prepared, teacher can ensure that it is appropriately delivered and correctly perceived.

One distinctly disparate result of our study is that although students appreciate this method of learning, only 38.4% consider it more effective than the routine teacher led lectures. 93% of the students considered teacher lecture/input after the session essential for learning. This student perception is also found in other Pakistani studies (Manzoor, 2014; Daud & Ali, 2014) but is distinctly absent from western studies (Castle et al, 2014; Gandhi et al, 2013; Lin et al, 2017). This was brought as a separate theme in FGD labelled "students can't teach the way a teacher can" which we explored in detail. It was teacher's clinical experience, the ability to give real life examples, solving controversies in medical literature and sorting out more important information from less important one that the students valued as unmatchable by a peer tutor. Since all of our topics were clinical, this might be one of the reasons why majority of our students wanted teacher to be present during the class and to deliver his lecture as well despite students’ prior presentation. Moreover, the role of teacher in making assessments was also pointed out by some students as one of the reason although not endorsed by all. Although we could not find support for this notion in any of the other PAL literature based in a clinical setting (Castle et al, 2014; Gandhi et al, 2013; Lin et al, 2017) one study from Australia did show that students placed higher value on feedback received from educators as compared to their peers (Sevenhuysen et al, 2014).

The overwhelming liking for lectures in this part of the world can also be partially explained by the fact that students still experience a college culture which is very much formal, hierarchical and teacher centred. This has been implicated as inhibitory to new ideas like peer learning (Naseem, 2012). Moreover, there is some evidence for role of racial identity in influencing group behavior as well. For example, in an American study it was found that Asian students preferred listener role as compared to white Americans, were more likely to report a dominator in
discussions and were less comfortable in whole class discussions (Eddy et al, 2015).

It is important to emphasize that majority of these students were experiencing PAL for the first time and had no previous experience of presentations in front of a big audience. Our study supports that some students are exceptional and can function as well as faculty but their number is small. Although this supports the notion of training a few students for these sessions but doing that might reduce the actual student engagement in PAL as our study clearly shows that the component of this activity perceived as the most useful by student was collaborative group work in preparing the material for presentations.

Our study supports the role of formal teaching sessions for teaching skills for success of such activities which is also highlighted by other authors (Freret et al, 2017; Burgess, McGregor & Mellis, 2014; Ross & Cameron, 2007). Although lectures are not part of "student as teacher" programs at least in the US (Soriano et al, 2010; Freret et al, 2017), one should consider placing them in all those programs which contemplate on using PAL in large groups.

Take Home Messages

1. PAL dynamics change in large groups.
2. Individualized teacher feedback and background small group collaboration to prepare for a large group session is the most valued aspect of such PAL activities.
3. Formal presentation / teaching skills can be incorporated in curriculum and can benefit all students in long-term.

Notes On Contributors

Afsheen Zafar is Professor of Surgery at Islamic International Medical College.

Ahmed Rehman was Associate Professor of Urology at Islamic International Medical College at the time of the study.

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Appendices

Survey Questionnaire

1. I liked the peer teaching component of the module.
2. Overall I am satisfied with the peer learning method.
3. I find peer learning more effective than routine teacher led lectures.
4. I did not find it useful for final preparation of exams.
5. The topics taught by my peers were more easily understandable.
6. Preparing presentations is too time intensive.
7. I am confident that my peer's presentations covered all the important aspects of topics they taught.
8. It is generally useful only for the topic for which I prepared.
9. I am more comfortable in asking questions from my peer presenters.
10. We could learn better without this component.
11. The teacher review on my presentation provided me with useful feedback.
12. Teacher lecture is necessary for preparation for exams.
13. Majority of my peers' presentations were just a waste of time.
14. I learned a lot from the group work involved in making presentations.
15. In my group everyone collaborated in preparing the topic for presentation.
16. I enjoyed the group work involved in making and delivering presentations.
17. I don’t understand why PAL is placed in the module.
18. List 2 to 3 advantages of PAL
19. List 2 to 3 issues/ drawbacks of PAL.
20. Any suggestions for improvement.

Scoring Key

| Subscale    | Item numbers |
|-------------|--------------|
| Acceptability | 1, 2, 9, 10, 12, 13, 16, 17 |
| Usefulness   | 3, 4, 5, 6, 7, 8, 11, 14, 15 |

Declaration of Interest

The author has declared that there are no conflicts of interest.