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The participation assurance test: A new teaching strategy to ensure student participation in learning

Narmeen Hashim[1], Sheraz Khan[2], Saniya Hashim[2]

[1]Department of Allied Health Sciences, Rehman Medical Institute, Peshawar, Pakistan

[2]Department of pharmacy, Comsats University Islmabad, Abbottabad, Pakistan

ABSTRACT

Introduction: Participation of students in learning determines their scholastic achievements. The current teaching systems do not assess student participation in learning rather than provide the grades based on knowledge recall.

Objective: The objective of this study was to develop and evaluate a teaching strategy that can provide a standardized measure of student engagement in the learning process.

Materials and methods: A quasiexperimental study undertaken in Rehman Medical College, Peshawar, KP, Pakistan (March–May 2018), involved 96 medical students (16 groups) of third professional MBBS present in small group format session on medical research. The participation assurance test administered after the lesson involved (i) written individual participation assurance test (iPAT) for individual performance, (ii) written team participation assurance test (tPAT) for team performance, (iii) perception-based peer evaluation pPAT for rating team members, and (iv) observer-based PAT (oPAT) by the facilitator for intra- and intergroup dynamics. Scores in numerical and Likert's scales were analyzed by SPSS 22.0 for the descriptive and comparative analysis and correlations, keeping $p \leq 0.05$ significant.

Results: Mean iPAT was 54.66 ± 12.80 compared to mean tPAT 75.96 ± 19.85($p \leq 0.001$), mean pPAT was 20.83 ± 5.14 compared to mean oPAT of 16.50 ± 4.99 ($p \leq 0.001$), and mean closed group oPAT was 4.19 ± 1.90 compared to open group oPAT of 12.31 ± 3.40 ($p \leq 0.001$). A significant correlation was obtained for iPAT and tPAT ($r = 0.564$, $p = 0.023$). The groups achieving ≥60 iPAT marks showed the significant correlations of iPAT with tPAT ($r = 0.869$, $p = 0.024$) and closed group oPAT ($r = -0.882$, $p = 0.017$); the groups scoring below 60 in iPAT showed the significant correlations of iPAT with tPAT ($r = 0.749$, $p = 0.013$), open group oPAT ($r = 0.636$, $p = 0.048$), and total oPAT ($r = 0.635$, $p = 0.048$).

Conclusion: The PAT was effective in assessing individual and team-based student participation and supports the adoption of the open group teaching strategy as more effective for student participation in learning.

Introduction

In recent higher education, the teaching strategy has switched from passive learning to active learning to involve students' participation in knowledge development [1]. Especially in medical education, there has been a complete drift toward active learning–teaching strategies that enhance the learning process by engaging the students in developing learning capabilities [2]. Active learning develops student interest and a better understanding of the knowledge. The student becomes fully engaged in receiving knowledge and thus performs efficiently in class. Not only the enhanced knowledge but also the active learning develops skills in interacting environment [3]. Active learning includes multiple teaching methods: activity-based teaching or two-way communication between teacher and student and peer interactions in solving problems. Active learning alone cannot excel, and it requires a mixture of teaching personality and teaching style [4].

One type of active learning is known as team-based learning (TBL) which allows students to work as a team to achieve a common goal. TBL can facilitate gaining knowledge through group discussions and active participation [2,5]. In TBL, the class is divided into small groups comprising of three to five students. The intragroup solves the assigned tasks under a teacher's supervision by interaction and discussions. The groups defend their answers by forming class discussions with other groups in a given time, thus embedding ownership and enthusiasm for the lecture [6,7]. Active TBL creates an environment of face-to-face communication, skills in inter- and intragroups, the self-confidence of working in teams, and an increased effectiveness of collaborative learning [3,8]. All the members of each group are responsible for their individual as well as teamwork. Assignments, quizzes, and all other activity-based tasks are done collectively [9]. The participation of each student is noted in the form of team reflection as well as peer evaluation grades. While in a group, students learn communication and leadership skills [4]. One type of TBL is the readiness assurance test (RAT). The RAT consists of two parts. In the first part, the students are individually tested for the assigned course work, known as iRAT. After iRAT has been submitted, teams cluster and answer the same question sheet in the form of a team, known as tRAT. Team RAT gives students' partial credit in the total scoring, and they learn the accurate answer and get to discuss their version of the answer with other groups of the class [10].

A new teaching method: Participation assurance test (PAT) is a student-oriented program that is scored based on students' participation in class [small group formats (SGF)]. PAT records the learning and understanding of students about the lectures. It is a tracker for evaluating students' contributions and mindfulness toward education. There will be two tests applied in PAT. One is the individual participation assurance test (iPAT) and the other is the team participation assurance test (tPAT). PAT will maintain the focus of students, will develop leadership, communication, and presentation skills in students, and will keep them attentive throughout the lecture.

It is similar to readiness assurance test (RAT) in having two stages iRAT and tRAT but differs RAT in not having the students to prepare any topic beforehand but to assess their individual/group activity and active learning during an actual learning session. This study is the first-ever study. PAT records the learning and understanding of students about the lectures. It is a tracker for evaluating students' contributions and mindfulness toward education. This study will assess and justify the grades based on the active participation of the student in class, contributing to the quality education.

The objectives of the study were to assess the mindfulness of students through a postlecture retention test iPAT, to evaluate the participation of individual students among their designated groups through observation of closed group dynamics, to evaluate the participation of student groups in class through open group discussions, and to evaluate the effectiveness of PAT as a new teaching strategy for improving participation during peer learning.

Materials and Methods

A quasiexperimental study was conducted at Rehman Medical College, Peshawar, KP, from March to May 2018. All third Professional MBBS students were included, who attended two medical research sessions, in which PAT strategy was carried out. The students who did not attend both the lectures were excluded. Ninety-six students participated through a universal sampling technique. The participants were arranged into 16 SGFs.

The PAT consists of two test stages: the first stage "iPAT" for each student and the second stage "tPAT" for each group. The tPAT score will be added to the iPAT scoring system.

Individual participation assurance test

The iPAT is to assess the capability of students' understanding through participation in class. PAT will be conducted in the second half, after delivering a lecture in the first half of the class. Only 10 minutes will be given for completing iPAT. It will consist of 4–5 questions related to the course work of ongoing lectures. The iPAT will be distributed to every student of the class. Questions will be precise and specific. The whole reason for iPAT is to find out how much students have been able to absorb during the lecture and how have they developed their understanding of it. The scores will be given to students based on iPAT, including students' attendance and assignment.

After collecting iPAT from each student, the peer evaluation forms will also be distributed. Based on six different characteristics, students will grade their members of the group according to their input. The peer evaluation scoring will be compared with their actual participation scoring (tPAT).

Table 1. Demographic data of the participants.

Variable	Percentage
Gender (n = 96)	4.37
Male	4.09
Female	3.64
Individual test scores (n = 78)	
High	24.4
Medium	64.1
Low	11.5
Team test scores (n = 74)	
High	64.9
Medium	35.1
Low	0
Peer evaluation scores (n = 96)	
High	26.8
Medium	52.0
Low	19.2

Table 2. Mean and significance of PAT.

PATs	Mean	SD	p value
iPAT	54.66	12.80	$p \leq 0.001$
tPAT	75.96	19.85	
pPAT	20.83	5.14	$p \leq 0.001$
oPAT	16.50	4.99	
Closed group oPAT	4.19	1.90	$p \leq 0.001$
Open group oPAT	12.31	3.40	

Figure 1. Percentage of students' participation in closed group discussion (oPAT).

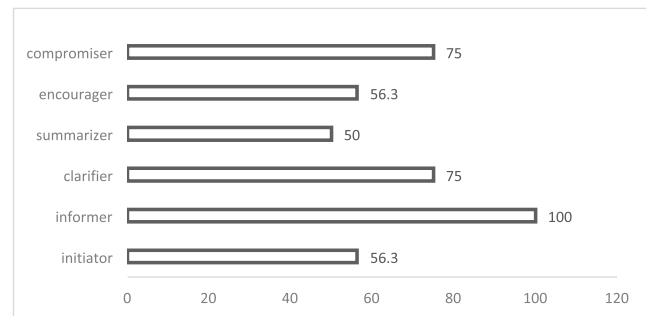### Team participation assurance test (tPAT)

The class will be assembled in groups and will be given tPAT forms. It will consist of 4–5 questions that require collaborative answers based on team discussions. A scoring of questions will be based on "closed group dynamics," considering the active participation of each member in a group, while the team effort will take place within 10 minutes. Each group will submit only one answer to every question after a discussion with the team members. The scoring of individual student's participation will be scored based on six characteristics. One mark is given for each characteristic if present in the student.

After submitting the tPAT as a group, open group discussions will take place among teams during the past 10 minutes of the class. In case of contradictions, teams will compete to prove their point. The tPAT will be conducted after the submission of iPAT. Once again scoring for open group discussion will be done by evaluating the group dynamics with the rest of the class. The scoring of open group discussion will be based on six characteristics on a scale of 1–3 (1 for aggressive attitude, 2 for passive attitude, and 3 for assertive attitude), and 3 is being the highest.

The participation of the students will be evaluated/analyzed based on the assignment scores, attendance, and peer evaluation grades along with scoring on iPAT, tPAT, closed group dynamics, and open group dynamics.

The frequency and percentages will be analyzed using descriptive data, whereas the correlation, Chi-square, and t-test will be analyzed using inferential statistics in the Statistical Package of the Social Sciences (SPSS) version 20. Tables and figures will represent the quantitative data.
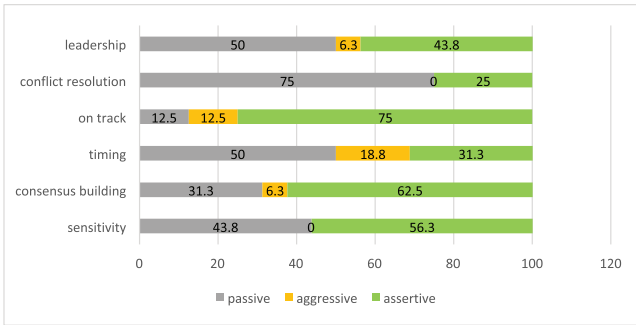
Results

In a total of 96 students, 47.9% were males and 52.1% were females. Most of the students (64.1%) scored medium on the individual test. However, in team test, most of the students (64.9%) had the high-level scores. Similarly, in the peer evaluation, most of the students (52%) showed a medium level of participation (Table 1).

Table 2 shows that the mean for team PAT was better than individual PAT and was found to be significant. However, the peer evaluation PAT was scored better than observed PAT and was significant. The students did better participation in open group discussions as compared to closed group discussions, and the relation was highly significant.

Figure 1 shows that, in closed/intragroup participation, all students (100) were informers, followed by compromiser and clarifier (75% each).

Figure 1 shows that, in open/intergroup participation, most of the students (75%) had on-track assertive discussions. Students were mostly (18.8%) aggressive while managing time during

Figure 2. Percentage of students' participation in open group discussion (oPAT).

Table 3. Correlation of PATs with high and low scorers.

Test types	correlation	*p* value
iPAT with tPAT	0.564	0.023
Correlation for ≥60 scorers		
iPAT with tPAT	0.869	0.024
iPAT with closed group oPAT	−0.882	0.017
Correlation for ≤60 scorers		
iPAT with tPAT	0.749	0.013
iPAT with open group oPAT	0.636	0.048
iPAT with total oPAT	0.635	0.048

discussions. However, highly passive component seen in students was conflict resolution (75%) (Figure 2).

Table 3 shows that individual and team-based test scores were significant. The students who scored more than 60 showed a significant relation of iPAT with tPAT as well as iPAT with closed group participation scores. However, the students who scored less than 60 showed significance among iPATs with tPAT and open group participation.

Discussion

When testing the students' performance, their scores were high in group activity with greater participation and in-depth learning. The students with low scores in individual tests also scored high in group tests and participation. In short, team PAT was found to be better for students than individual PAT. The perception-based scores of students were better than the scores given by the facilitator, and the students also scored higher when participated in open group discussions compared to closed group dynamics.

For the complicated studies, a cooperative learning is a suitable practice for student participation and long-term memorizing study material. By cooperative learning, students develop strong interpersonal relationships, self-esteem, social competencies, and academic support. Only group learning can give students the potential to have in-depth understanding of the knowledge which cannot be provided in traditional teaching methods. It is also a platform for students to receive the feedback from group members and encouraged to participate more [11]. Appropriately used collaborative learning activities do promote student learning and student satisfaction [12].

Group learning supports the comfort and gives an equal chance to all types of personalities among students to participate, which brings all the students to the same level of learning. This student learning strategy may prepare the students for the future workforce [13]. Most of the students observed that TBL was effective, engaging, and enjoyable than traditional strategies. The academic performance of weaker students was improved by subjecting them to TBL [14]. One of the Japanese [15] research works showed a positive correlation of peer evaluation with academic test scores. The results of the final examination showed the higher scores of Japanese students who studied through TBL method [16].

The students appeared to feel that the exercises involving five members in a group were more productive and academically better. Groups who simply interacted more also tended to perform better on post tests related to the discussed material [17].

After receiving the positive feedback from students and facilitators, this new teaching strategy was designed to be implemented throughout the curriculum of basic sciences. The marks obtained from regular scoring system was compared with marks obtained from PAT and surprisingly the top students of traditional examination received lowest score in Participation Assurance Test because of their no clarity of the topic. Based on this shocking evidence, PAT was considered an excellent teaching strategy effective for the educational institutes.

Limitations

The study was conducted on small sample size and in only one medical college of Peshawar.

Conclusion

PAT was effective in assessing student participation in learning. PAT was accepted and felt to be useful by students for their learning.

Recommendations

The same teaching strategy must be implemented in early school years so that students of any academic background can participate actively instead of relying only on cramming words to achieve good grades.

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