To study the Effectiveness of Jigsaw Technique as Learning Tool on the Performance of Phase -1 MBBS Students in Anatomy at Gmc kathua

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Abstract

Introduction: There are multiple factors in the latest trends in curriculum and medical education which demand changes in teaching learning methods with a dramatic change in the pattern of teacher centred teaching methods to students centred learning methods. Jigsaw technique is a learning methodology where students learn by teaching one another.

Methodology: The study was conducted in the dissection hall of the Department of Anatomy Gmc Kathua. Hundred students participated in this study through the didactic lecture two topics were taught which were already chosen. Pre-test was taken and the topic was again taught by jigsaw technique. Student's knowledge was judged by taking a post test after the completion of this technique. Scores of both the tests were calculated and the difference in the mean was estimated and compared by applying a paired t test.

Results: Differences in the performance of students in pre-test and post test was calculated by applying paired t test which was found to be statistically significant ($p<0.001$).

Conclusion: Students show better performance when they are involved actively in learning and found this method helpful, interesting and motivating. There was an eloquent difference in the performance of the students in the pre-test and post test scores.

Keywords: Didactic lecture, jigsaw method, teaching and learning, cooperative learning.

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Introduction

Didactic method of teaching is the most popular and oldest method of teaching. It involves face to face interaction between students and teachers. The most popular method of delivering information to the masses is lecture. The drawback of didactic practice is inadequate in learning disabilities. So the modification in the traditional teacher oriented approach using the student centred teaching methods and techniques are necessary. Jigsaw technique may be a kind of active learning method. Jigsaw method at first was developed by Aronson et al (1978) which is a collaborated learning technique. The aim of the jigsaw technique is that students can learn actively with each other in groups and also teach to their colleagues. By using jigsaw technique students showed improvement both academically and socially by interacting with each other to achieve a common goal. A single topic is divided into subtopics in jigsaw technique; the students are divided into groups and learn the topics into parts.

Methodology

The present study was undertaken in the department of anatomy among 100 first professional MBBS students. Prior permission for the study was sought from the ethical Committee. Dissection hall was selected as the venue for the study.

Inclusion criteria: Students of phase 1 MBBS, Gmc Kathua in the age group of 18-30 years.

Exclusion criteria: Students absent on that day will be excluded.

All the faculty members of the department of anatomy were sensitized toward the concept of jigsaw technique which is one of the small group active teaching-learning methods. On discussing with other faculty members of the anatomy department two topics from the head and neck (parotid and thyroid gland) were chose to be taught. A small interaction was held in the dissection hall after the completion of didactic lecture of the topic chosen, about the present pattern of study and other methods adopted by them for learning. Next day in the dissection hall a pre-test was conducted which comprised of multiple choice questions and short answer questions. Students were sensitized to jigsaw technique and were encouraged to learn given topics by jigsaw technique. Post test was conducted on the same pattern. A meeting was conducted with the faculty members to inform them of the result of the students performance in the tests conducted. After the didactic lecture of the chosen topics for the study, brief interaction was held with the students in the dissection hall about the current studying pattern of the students and various methods of learning adopted by them and a pretest of the topic taught by didactic lecture was announced for the next day. Next day, a pretest comprising of short answer questions (SAQs) and multiple-choice questions (MCQs) was conducted in the dissection hall. Following this, the students were sensitized to the jigsaw technique and were encouraged to learn the chosen topics by jigsaw technique. All the students were subjected to posttest on the same pattern. A second session with the faculty members was also held to apprise them of the results of student performance in the tests conducted.

Illustration of the jigsaw technique: The jigsaw technique is a group-work method for learning and participating in learning activities. The jigsaw technique uses a step by step process.

Step 1: The pretest questionnaire consist of short answer questions and multiple choice questions.

Step 2: Jigsaw technique was thoroughly described to the students and the students were divided into 20 – small groups, each group having five students, where each and every student was given a number one, two, three, four and five. Every student per group was assigned a number 1,2,3,4, and 5. The reason for five students in each subgroup was that the subtopics decided from the main topic were 5 in number. All these subgroups were named “Home Groups”

Step 3: Each student had alloted a number, the home groups were broken apart, were reorganized by numbers allotted to them into new “ Expert Groups” Like all, the ones, twos, threes, fours, and fives constituted expert groups, respectively

Step 4: From the overall topic a specific subtopic was allotted to every student in each expert group. The distribution of the subtopic was as follows:

Expert group 1- Gross features, peritoneal and visceral relations of the parotid gland.

Expert group 2- Blood supply of the parotid gland.

Expert group 3- Lymphatic drainage and nerve supply of parotid

Expert group 4- Embryology and histology of parotid

Expert group 5- Applied anatomy

Step 5: All the students were allowed to discuss the subtopic among them, share the ideas, search the Internet and consult books in the library. By this they understood the concepts of the common topic they all have read and clarified their doubts.

Step 6: Then, the expert groups returned to their original home groups to present, after broke apart and discuss the topic they have studied. Each and every student brought with them the knowledge gained (as expert group) and had command on one of the subtopics. This way every topic got taught by a peer to all the students in the home group and everybody was well versed with the complete topic. Teachers acted as facilitators to ensure the smooth transition of the development of the topic given to the students and also to monitor the healthy group processes and discussions.

Step 7: After the completion of the jigsaw exercise, the facilitators first checked that the topic is covered and then called all the students in a large group to allow time for solving their queries, questioning by other home groups, and any further clarification.

Step 8: Another test named post test was conducted which comprised of short answer questions and multiple choice question to assess the knowledge of students. Pre and post test questionnaires were designed after discussing with the whole faculty, expertise in the subject of Anatomy. Pretest and posttest questionnaire were different.

The second topic was also taught by this method of jigsaw technique and knowledge gained by the students was again judged by another test comprising of Short answer questions and multiple choice questions. In two tests the marks obtained by the students were compiled and analyzed statistically.

Observations:

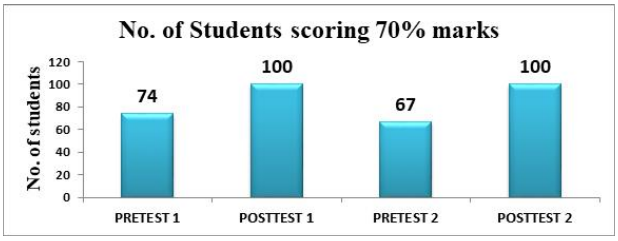

Figure 1: Bar chart showing difference in the performance of the students in pre and post-tests

Table 1: Pre & Post Jigsaw Technique Assessment Scores of Students Using The Jigsaw Technique

	Paired Samples Statistics			
	Mean	n	SD	SEM
Pair 1				
Marks of topic 1 by didactic lecture	**7.68**	**100**	**1.734**	**.173**
Marks of topic 1 by jigsaw teaching	**9.68**	**100**	**.584**	**.058**
Part 2				
Marks of topic 2 by didactic lecture	**7.11**	**100**	**1.129**	**.113**
Marks of topic 2 by jigsaw teaching	**9.87**	**100**	**.442**	**.044**

Significant increase in marks of students by viewing their average means.

SD : standard deviation

SEM: standard error of mean

Table 2: Paired differences between the scores with significant P

	Paired differences						
	Mean difference	**SD**	**SEM**	**95% CI of difference (lower-upper)**	**t**	**df**	**Significance (two tailed) P**
Pair 1							
Marks of topic 1 by didactic lecture - Marks of topic 1 by jigsaw teaching	**-2.005**	**1.756**	**.176**	**(-2.353 - 1.657)**	**-11.418**	**99**	**0.000**
Pair 2							
Marks of topic 2 by didactic lecture - Marks of topic 2 by jigsaw teaching	**-2.765**	**1.188**	**.119**	**(-3.001 - 2.529)**	**-23.274**	**99**	**0.000**
P<0.05 which is significant							
SD: standard deviation							
SEM: standard error of mean							
CI: confidence interval							
df: degrees of freedom							

Table 2 showed a significant increase in the marks of the students by viewing the average mean i.e 7.68-9.68 of pair 1 and 7.11-9.87 of pair 2**.** Pre and post jigsaw technique assessment scores as shown in the table 2. By viewing the average mean there was a significant increase in the marks of student's i.e. 7.68-9.68 of pair 1 and 7.11-9, 87 of pair 2. Paired t-test was used to determine the difference in the performance of students in Pre and -post test. In the present study, Paired t-test was found to be statically significant. To assess the knowledge acquired by the students an evaluation test was taken after the completion of each topic taught by jigsaw method. Both Short answer questions and multiple choice questions were included in the evaluation test. In the figure 2 result showed that, hundred students in the first topic 100 (100%) and hundred students in the second topic 100 (100%) scored 70% or more marks taught by jigsaw technique as compared to pretest, where only 74 (74%) and 67 (67%) students could score 70% or above marks.

Discussion

To promote the interaction of students and make them self learners, Active learning plays an important role in new curriculum where the students are the active participants and play an important role in learning. One of the popular and important methods is jigsaw method. It is a better active learning method and generates interest in learning topic. Everyone get a chance to involve and put their views with better understanding of concept. Saleh et al in their study observed that small group teaching was effective and majority of the students showed positive attitude towards problem oriented interactive session. Azmin NH found a significant difference between the pre-test score and post-test score in a study conducted on psychology students following the jigsaw method of teaching. The findings of the study support the use of jigsaw based cooperative learning in the classrooms. Lalit M and Piplani S in their study observed that learning by jigsaw technique showed the active participation of the students and was s revitalizing and believed to improve information retention and problem solving abilities. Parmar and Rathod in their study observed a significant increase in the post test score. Srivastava and Waghmare also found a significant difference in post test scores by jigsaw technique.

Conclusion

The use of the jigsaw technique in the present study showed the active participation of the students and faculty. Student's also reported benefitted and performed better by using this technique. Students enjoyed more via active participation rather than passive learning. For the improvement of medical education jigsaw method should be included in curriculum along with didactic teaching method.

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