

## Perception of quiz as an adjunctive learning modality in clinical microbiology amongst medical students of central India

Abhishek Mehta<sup>1\*</sup>, Himanshi Bansal<sup>1</sup> and Kiran Tripathi<sup>1</sup>

<sup>1</sup>Department of Microbiology, Government Medical College, Datia, Madhya Pradesh, India

### Abstract

**Background:** The conventional teaching modalities like lectures if practiced alone can't transfer concepts as effectively as active learning approaches like quiz and serve only as a data transferring tool. There is a wide range of educational benefits of quiz like enhanced learning, conceptualization and improved academic performance which makes it the right candidate to be explored as an adjunctive learning tool.

**Purpose:** This study was undertaken to document perception of students regarding utility of quiz as a complementary teaching modality.

**Methodology:** In this interventional study conducted in the Department of Microbiology, Govt. Medical College, Datia, India. Second MBBS students were divided into two groups of 34 students each. The topic standard precautions were covered through two learning modules. One module through didactic lecture to one group and through self study followed by quiz to another. Cross over was done for the other module.

The students' perceptions regarding the utility of quiz as an adjunctive learning tool were recorded on the five point Likert scale in addition to the general feedback.

**Results:** On analyzing the feedbacks, majority of students were found to be very receptive and inclined towards the active learning methods like quizzing. They felt more involved, interested and motivated through such sessions.

**Conclusions:** The students' perception regarding quiz was very positive. So, there is a need to explore the prospects of incorporating such active teaching learning modalities as adjunctive learning tools in medical education.

**Keywords:** didactic lectures; adjunctive learning modality; self directed learning; module; Likert scale

**\*Corresponding author:** Dr. Abhishek Mehta, Associate Professor, Department of Microbiology, Government Medical College- Datia, Datia (Madhya Pradesh) -475661, India. Mobile: +91-8077538542; Email: [abhishekmehta623@gmail.com](mailto:abhishekmehta623@gmail.com)

Received 4 November 2020; Revised 25 November 2020; Accepted 4 December 2020; Published 16 December 2020

**Citation:** Mehta A, Bansal H, Tripathi K. Perception of quiz as an adjunctive learning modality in clinical microbiology amongst

medical students of central India. J Med Sci Res. 2021; 9(1):24-30. DOI: <http://dx.doi.org/10.17727/JMSR.2021/9-5>

**Copyright:** © 2021 Mehta A et al. Published by KIMS Foundation and Research Center. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

## Introduction

The conventional teaching learning modalities like didactic lectures are mainly teacher centric rather than learner centric with little scope for student participation and peer interaction. Such passive modalities if practiced alone can't transfer concepts as effectively as active learning approaches serving only as a data transferring tool being less effective at developing skills and in generating attitudes. However the average attention span of a student during lectures is just 20 minutes and thereafter declines abruptly if not revived or triggered with any activity [1].

Active learning strategies being student centric encourages self directed learning, collaboration and communication with better participatory involvement of students. This helps in better retention of information and improving students' conceptualization of the topic [2].

The incorporation of educational games like quizzing as teaching learning modality may help in developing students' cognitive, emotional, motivational and social outlook [3].

There is a wide range of educational benefits of quiz like enhanced attention, learning, retention, interest, academic performance, attendance, besides helping them to process the information in a more meaningful way and fostering self directed learning [4].

The previous studies also suggest an inclination of students towards active learning methods which they found more interesting, motivational and fruitful.

A number of medical education researches have been conducted globally to assess the educational benefits and the student's views/ perceptions regarding the active teaching learning modalities like quizzing. But a very few studies have been conducted regarding the same in Indian subcontinent.

This is the need of the hour to explore and investigate students' perceptions, views, opinions and suggestions regarding the application of such modalities.

In view of this background, this interventional study has been undertaken to study the perceptions of second MBBS medical students regarding the utility

of quiz as an adjunctive learning tool in medical education.

## Methodology

This educational interventional study was conducted in the Department of Microbiology, Govt. Medical College, Datia, India after obtaining permission from institutional ethics committee.

The ongoing batch of second MBBS was divided into two study groups, Group-A and Group-B each comprising of 34 students. The topic "Standard precautions for medical & paramedical professionals" was split into two parts to be covered in two sessions/ modules, one for each group separately.

*Module-1:* Hand hygiene, personal protective equipment (PPE), decontamination, respiratory hygiene. *Module-2:* Spills management, sharps management, biomedical waste management.

Participation in the study was voluntary after taking informed consent from study subjects. Participants were sensitized regarding the content & purpose of the study in advance.

In the first session Group-A was taught the Module-1 by didactic lecture and Group B by self study followed by quiz. For the second session cross over was done. Two lecture sessions covering the two modules were conducted separately for 34 students from each group, by power point presentation.

The students were informed of the topic & schedule one week before & instructed to refer to the standard textbooks and authentic study material.

Two quiz sessions each of 2 hours, duration were conducted in the Demonstration hall, Department of Microbiology, Govt. Medical College, Datia, India.

**Quiz-1:** Module-1

**Quiz-2:** Module-2

*Each session comprising of four rounds*

Round-1: True/False questions

Round-2: Multiple choice questions

Round-3: Visual round

Round-4: Rapid Fire round

From each group (34 students), eight students were randomly picked as quizzers on the day of quiz so

that everyone will read and come. Four teams were formed, two students in each team. The decision of the quiz master was final. Cumulative scores of all the rounds were taken into account while preparing the result.

The students' perceptions regarding the utility of quiz as an adjunctive learning tool were recorded on the five point Likert scale in addition to the general feedback.

A pre-validated self-administered questionnaire with 10 items was used for data collection. Responses were elicited for each item meant to assess perceptions towards quiz as strongly disagree, disagree, neutral, agree and strongly agree on a Likert's scale with scores ranging from 1 to 5 points respectively. There was one negative question for which scoring was done in the reverse order i.e. after correction, higher scores indicate disagreement with that item. The data was entered into Microsoft Excel and mean with standard deviation were calculated. Cumulative scores  $\leq 20$  was considered poor, 21-30 as neutral and 31-50 as favorable level of perception [1,4-8].

While taking the general feedback participants were instructed to throw light and comment upon three

major issues: (1) Quiz attributes acting as learning facilitators, (2) Hindrances in learning during sessions, (3) Suggestions for better implementation.

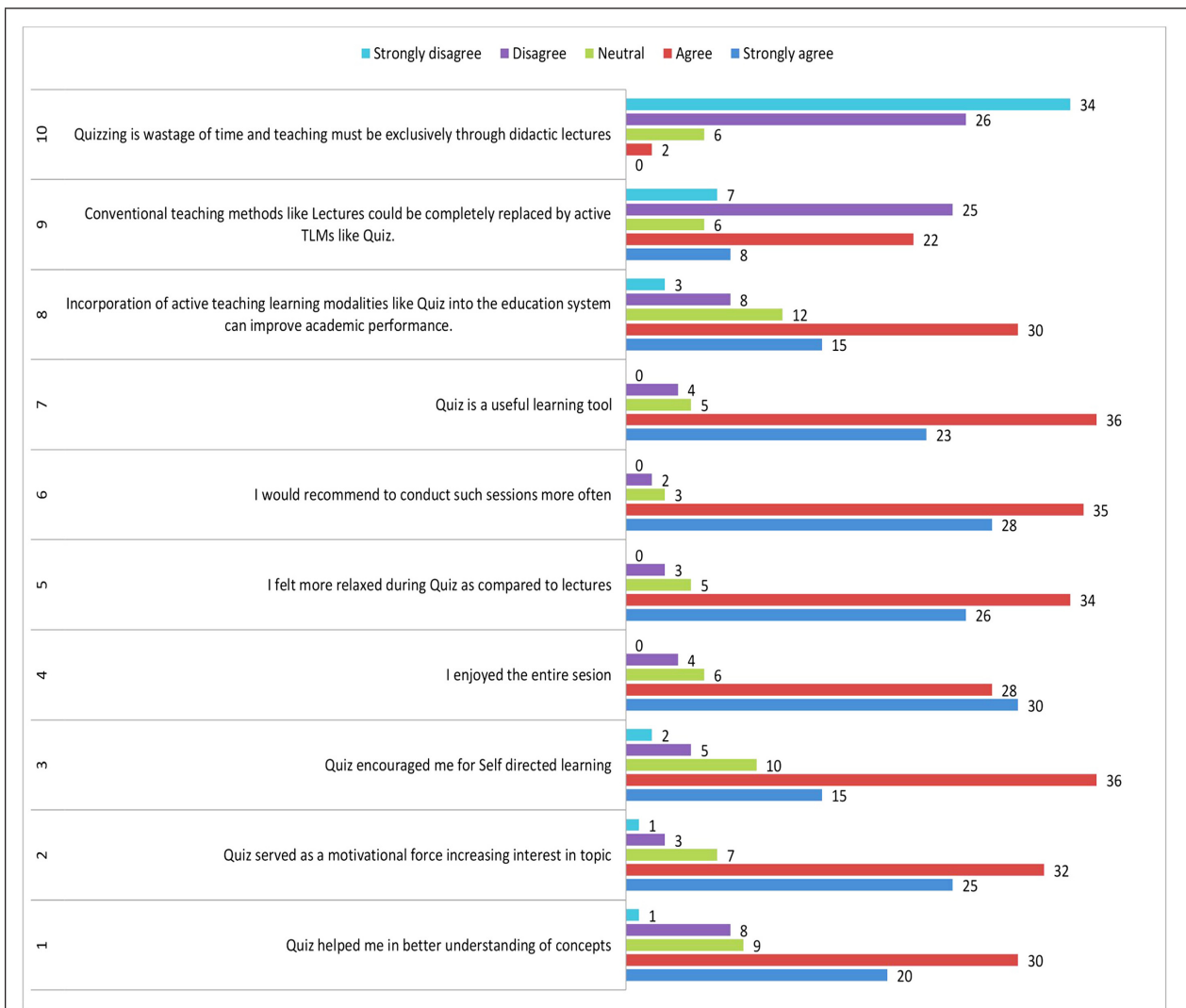
## Results

On analyzing the students' feedbacks elicited on 5 point Likert scale, majority of students were very receptive and inclined towards the active learning methods like quizzing and shown a very positive attitude towards such adjunctive modalities. More than 70% of students found quiz as a useful learning tool. More than 85% of students enjoyed the entire session and felt more relaxed during quiz as compared to lectures. More than 90% of students wanted that such quizzing session should be conducted more frequently. While 67% of students were in the opinion that the active learning approaches like quizzing improves academic performance, only 14% showed disagreement, rest being neutral. Only 44% of students felt that the conventional teaching methods could be completely replaced by active learning modalities like quiz, while 47% showed disagreement, rest being neutral. Only 2 students (0.03%) felt quiz as wastage of time and that teaching should be exclusively through didactic lectures as done earlier (Table 1, Figure1).

**Table 1:** Students' perceptions regarding quiz as an adjunctive learning tool (n=68).

S. No	Question	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Mean score (SD)
1.	Quiz helped me in better understanding of concepts	20	30	09	08	01	3.88 (1)
2.	Quiz served as a motivational force increasing interest in topic	25	32	07	03	01	4.13 (0.87)
3.	Quiz encouraged me for self directed learning	15	36	10	05	02	3.84 (0.96)
4.	I enjoyed the entire session	30	28	06	04	00	4.235 (0.84)
5.	I felt more relaxed during quiz as compared to lectures	26	34	05	03	00	4.22 (0.71)
6.	I would recommend to conduct such sessions more often	28	35	03	02	00	4.31 (0.7)
7.	Quiz is a useful learning tool	23	36	05	04	00	4.15 (0.8)
8.	Incorporation of active teaching learning modalities like quiz into the education system can improve academic performance.	15	30	12	08	03	3.676 (1)
9.	Conventional teaching methods like lectures could be completely replaced by active TLMs like quiz.	08	22	06	25	07	2.98 (1.25)
10.	Quizzing is wastage of time and teaching must be exclusively through didactic lectures	00	02	06	26	34	4.35 (0.76)

Abbreviations: TLM: Teaching learning methods; SD: Standard deviation.



**Figure 1:** Students' perceptions regarding quiz on 5 point Likert scale.

Nearly all of the students (90%) exhibited favorable perception levels towards quiz but half of them felt that it could not be an absolute substitute to the conventional teaching methods.

Some important quiz attributes reported by majority of students as learning facilitators were triggering interest in the topic, motivating, better understanding of concepts, better retention, fostering self directed learning, promoting healthy competition, active participatory involvement, student centric, relaxing & enjoyable mode of learning.

The hindrances reported by most of the students were the entire exercise requires a lot of preparations prior to and during the sessions in terms of extra efforts, time and resources. It could not be conducted

by a single teacher like in conventional teaching but requires a team work.

Many students felt that in absence of proper strategic planning, the entire activity remains restricted to the quizzers only, rest of the students serving as passive audiences with no active participatory involvement and hence the purpose of the modality as effective learning tool may fail. So, for a quiz session to be fruitful in terms of learning, the organizing team should be well prepared with proper planning & content and motivated enough, then only they could motivate students to be involved actively in this learning process.

Most of the students suggested that such quiz sessions should be conducted regularly and more

frequently and should contain more interesting content esp. in audiovisual format. More number of students should get a chance to participate in the quiz and the sessions should be designed in such

a way so as to involve the audiences more actively, so that they don't lag behind in the learning process (Table 2).

**Table 2:** Summary of students' feedback regarding quiz.

<i>S. No</i>	<i>Feedback</i>	<i>Response</i>
1.	Quiz attributes acting as learning facilitators	Enjoyable, relaxing, interesting, motivating, interactive, active participatory involvement of students (student centric), informative, breaks up the monotony of conventional teaching, Helps in building healthy competitive spirit, fosters self directed learning, helps in better conceptualization and understanding, more communicative, collaborative approach, enhances learning.
2.	Hindrances in learning during sessions	It requires more efforts, time & resources on the part of facilitators as compared to conventional lectures. As the questions are mainly targeted towards quizzers, rest of the students being audiences are not so actively involved in the sessions except for some questions being passed on to audiences.
3.	Suggestions for better implementation	More students should get opportunity to participate in the quiz. There should be active involvement of audiences too apart from quizzers. Quiz sessions to be conducted frequently. There should be more rounds per session. Quiz rounds should include more of the interesting content.

## Discussion

In our study the students has shown a very positive attitude towards quiz as evident from their feedbacks. Many of them found that quiz has triggered their interest in the topic thus enhancing the learning of the concepts. This finding is in accordance with the similar studies conducted in recent past [1, 2, 5, 7].

Most of them were very receptive towards the adjunctive modalities like quiz which they feel has potential to improve academic performance. This perception is supported by the studies conducted [2, 7, 9, 10].

Majority of students shared a common view regarding the active approaches like quizzing as motivating, facilitating better understanding and retention, relaxing & enjoyable mode of learning. Similar findings were recorded by few studies [3, 6, 11].

Most of the students felt that such quiz sessions should be conducted at regular intervals and more frequently. This view was also reported by other similar studies [1, 3, 6].

In a study by Siegle 2015, students enjoyed the quizzing experience and found the new innovative method of learning as more interesting, interactive, informative and more effective [3].

Sawarkar et al. 2015 found that by this method the students had an opportunity to gain deep insight in the subject by referring to the learning resources like books, internet, and research articles for preparation. It also enhanced their capacity to apply their knowledge critically [7].

Joseph M et al. also felt that traditional methods of educating medical students are no longer sufficient in the current era largely influenced by multimedia. Instead of traditional didactic lectures, they focused on simulation based learning and its effect on students [8].

Asim et al. 2015 found that lectures alone are not generally sufficient in teaching and are not very effective means of transferring and acquiring information, even less effective at skill development and in generating the appropriate attitudes. The quiz session turned out to be a strong and effective mode of teaching [9].

In a study conducted by Gokcora et al. in City University of New York, it was found that students who were administered frequent quizzes score significantly higher on the standardized CUNY test than students who do not take frequent quizzes in their remedial reading classes. They reported that having frequent quizzes motivated them to study regularly and even improved their levels of communication [10].

In response to the survey question asked by Morera et al. regarding quizzes' usefulness in keeping up with subject content, students gave quizzes a rating between 4.06 and 4.20 out of 5. This, together with high levels of participation and high average grades, shows that quizzes has been very helpful [11].

A study was done in Iran, to determine the effect of weekly quiz tests on midterm and final test scores in Maternal and Child Health Course. The findings of study showed that there was a significant difference in the mean scores of midterm and final exam in a weekly quiz and usual method and quiz tests increased the mean test scores [12].

In India, a survey of attitudes of medical students towards the pediatric quiz conducted by the Indian academy of Pediatrics was carried out. The students had a favorable attitude but they were not able to devote sufficient time to the preparation as they were preoccupied with other subjects [13].

Siegel et al. and Likorish et al. found that the use of games as educational tools could play wonders through the development of students' cognitive, motivational and social outlook [3, 14].

Similarly Chhabra et al. also studied results of DREEM questionnaire (Dundee Ready Education Environment Measure) on third year post-graduate students, and found it better than traditional teaching methods [15].

Though most of such similar studies conducted in recent past has highlighted the favorable perceptions of students towards active teaching learning modalities like quiz and their academic benefits, unlike our study very few has explored the darker side of the same. In our study students feedback regarding the hindrances, problems and shortcomings of the modality was also sought. Many students had pointed out that such sessions require lot of preparations, time and resources and a proper strategic planning. In absence of active participatory involvement of all students and not just the quizzers, the purpose of the modality as effective learning tool may fail.

Students came out with some very useful suggestions that the organizing team should be well prepared with proper planning & content and motivated

enough, then only they could motivate students to be involved actively in this learning process.

## Conclusion

The findings of this study indicate that gamification of learning through quizzing enhances students' interest in the topic, and motivate students to become more competitive, collaborative and ambitious for academic success. Though the newer active teaching learning modalities like quizzing may not replace the conventional predominantly practiced teaching modalities like lectures but they can play a significant role as adjuvant learning tools when blended with the traditional teaching; complementing with the later for enhanced learning experience. There is growing need to explore the prospects of introducing newer interactive approaches like quizzing as reinforcers in learning process. This perception survey paves the way for more extensive studies in near future aiming at comparing the conventional teaching tools with the active learning modalities like quizzing in terms of learning gain.

## Conflict of interest

There are no conflicts of interest.

## References

- [1] Devi K, Parasakthi A. Quiz as an innovative approach in teaching community medicine to medical students. *Nat J Comm Med*. 2014; 5(2):182-185.
- [2] Devi K. Comparison of quiz vs lecture method. *Nat Journal Res Comm Med*. 2017; 6(3):200-205.
- [3] Siegle D. Technology: learning can be fun and games. *Gifted Child Today*. 2015; 38(3):192-197.
- [4] Talsania N, Barot D, Chaudhari A, Patel S. Quiz versus didactic lecture on undergraduate students of BJ medical college, Ahmedabad: A cross sectional, comparative, and interventional study. *Int J Sci Stud*. 2015; 3(7):86-91.
- [5] Mahajan PB. Quiz as a teaching and learning method in community medicine. *The health agenda*. 2014; 2(2):40.
- [6] Shankar PR, Sen PK, Dawka S, Barthakur R. Student participants' perception about medical quiz at the Manipal college of medical sciences, Pokhara, Nepal. *J Instit Med*. 2007; 29(1):30-33.
- [7] Sawarkar G, Kuchewar V, Desai P. efficacy of quiz as a teaching and learning tool for first year ayurved students. *J Hum Sport Exer*. 2015; 2(2):92-95.
- [8] Joseph N, Nelliyanil M, Jindal S, Utkarsha, Abraham AE, et al. Perception of simulation based learning among medical students in South India. *Annals of Medical & Health Science Research*. 2015; 5:247-252.
- [9] Asim S, Naz S, Zulfiqar A. Quiz -An innovative practice in medical education. *Pakistan J Med Heal Sci*. 2015; 9(4):1413-1415.

- [10] Gokcora D, Paulo DD. Frequent quizzes and student improvement of reading: A pilot study in a community college setting. *SAGE Open*. 2018; 8(2):1-9.
- [11] Morera LS, Azofra AA, Hernández LG. Analysis of online quizzes as a teaching and assessment tool. *J Tech Sci Edu*. 2012; 2(1):39-45
- [12] Delaram M, Shams S, Gandamani HS. Effect of quizzes on test scores of nursing students for learning maternal and child health. *J Med Edu Spr*. 2017; 16(2):118-122.
- [13] Verma M, Singh T. Attitudes of medical students towards IAP pediatric quiz. *Indian Pediatr*. 1993; 30:403-407.
- [14] Licorish SA, Owen HE, Daniel B, George JL. Students' perception of Kahoot!'s influence on teaching and learning. *Res Pract Techn Enhan Learn*. 2018; 13(9):1-23.
- [15] Chhabra S, Misra AS, Shah S, Kole T. Survey of student perception of medical education environment among emergency medicine residents of an academic medical centre in Northern India. *Int J Emerg Med*. 2016; 9:5.