



Evaluating Teaching and Learning Modalities in Higher Education: The Case of BAMS Students

**Swapnil Borage^a, Bharat Rathi^{b*}, Priyanka Shelotkar^c
and Suvarna Dangore^{d≠}**

^a Department of Shalakyatantra, Mahatma Gandhi Ayurveda College, Hospital and Research Centre, Salod (H) Wardha, Maharashtra, Datta Meghe Institute of Medical Sciences (DU), Nagpur, India.

^b Department of Rasashastra and Bhaishajya Kalpana, Mahatma Gandhi Ayurveda College, Hospital and Research Centre, Salod (H), Wardha, Maharashtra, Datta Meghe Institute of Medical Sciences (DU), Nagpur, India.

^c Department of Kaumarbhritya, Mahatma Gandhi Ayurveda College, Hospital and Research Centre, Salod (H) Wardha, Maharashtra, Datta Meghe Institute of Medical Sciences (DU), Nagpur, India.

^d Department of Oral Medicine & Radiology, Sharad Pawar Dental College & Hospital, Datta Meghe Institute of Medical Sciences (DU), Nagpur, India.

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/JPRI/2022/v34i28A36025

Open Peer Review History:

This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: <https://www.sdiarticle5.com/review-history/82315>

Study Protocol

Received 20 January 2022

Accepted 17 March 2022

Published 31 March 2022

ABSTRACT

Background: During the COVID-19 pandemic, institutions were obliged to change the teaching methods, as conventional teaching methods were not adoptable for the legislations of COVID-19 protocols. Students in large number started enrolling in the online courses. The reviews about the effectiveness of the online teaching were mixed reviews when focused on academic achievement. Many learners and teachers also opine that, traditional teaching is still a better option to online teaching. Blended teaching is a way to unite the two teaching methods and can be useful in overcoming the shortcomings of both the teaching learning methods.

Objectives: To compare understanding of topic by final year BAMS students, using Conventional teaching, Online teaching, and Blended teaching.

Methodology: 70 students from final year BAMS, will be selected for the study, which will be

[≠]Professor and HOD;

*Corresponding author: E-mail: bharat.rathi@dmimsu.edu.in;

taught by Conventional, online and Blended method, in rotation. A pre test and post test will be conducted to get the results.

Results: The data will be analyzed to identify the effectiveness of the teaching method, in terms of difference in the mean Pre test and Post test scores.

Conclusion: If found effective, educational institutions must adopt blended teaching method over traditional and online teaching method to the larger favor of students

Keywords: Online teaching; blended teaching; teaching modalities.

1. INTRODUCTION

The COVID-19, not only lead us to change our lifestyles, but also our teaching learning methods, for prevention of the pandemic. Changes in medical education have also occurred as a result of current teaching methodology changes as a result of the cancellation of traditional classroom instruction [1]. According to a recent higher education study, more than 2.35 million students registered in online courses in the fall of 2004. [2]. According to the survey, many postsecondary institutions are adopting online education as a long-term plan. Given the growing rise of online education and its importance to postsecondary schools, higher education institutions must provide high-quality online programmes. According to the literature, there are two approaches to assess the quality of online education: student achievement and satisfaction. Some scholars suggest that online education can be as successful as traditional classroom instruction, despite inconsistent results from academic achievement studies [3-4]. Students were both satisfied and dissatisfied in several research studies on student satisfaction in online courses or programs [5-6]. One of the most important tasks for teachers is to compare, analyse, and evaluate the methods they use in the classroom in order to motivate students and improve learning outcomes [7]. As a result, an attempt has been made in this study to compare the online teaching method with conventional teaching.

1.1 Need of the Study

Students, teachers other nonteaching members of the institutions providing higher education are getting familiar with the online teaching methods, applications, technical modalities, and issues with it. Many Universities have developed strategic plans for implementing online education. Technical soundness, training to use the applications, availability of gadgets, good quality internet. can also be some compounding factors. But the myths, doubts, and false

conceptions about the ways online teaching is conducted, creates a need to research the effectiveness of the online teaching, in comparison to conventional teaching and blended teaching. Hence, the present study aims at comparing degree of understanding a particular topic by students with online teaching, conventional teaching, and blended teaching methods.

2. AIM AND OBJECTIVES

Aim: Comparative evaluation of understanding of topic by Final year BAMS students using online teaching, conventional teaching, and blended teaching method.

Objectives:

1. To evaluate the understanding of topic by final year BAMS students using conventional teaching.
2. To evaluate the understanding of topic by final year BAMS students using online teaching.
3. To evaluate the understanding of topic by final year BAMS students using blended teaching.
4. To compare the understanding of topic by final year BAMS students using online teaching, conventional teaching and blended teaching.
5. To evaluate the perception of students regarding online teaching, conventional teaching and blended teaching method.

2.1 Study Design

Observational study.

Case definition: Final year BAMS students willing to participate in the study.

3. MATERIALS AND METHODS

Selection of Subjects:

3.1 Inclusion Criteria:

1. Final year BAMS students, irrespective of their gender.

3.2 Exclusion Criteria

1. BAMS students, other than final year class
2. Students not willing to participate in the study.

3.3 Withdrawal Criteria

1. Students not willing to continue the participation in study
2. Students using any unfair means during the test.

Period of Study: 12 months.

Sample Size: 70 (Final year class strength).

3.4 Intervention

Total 70 students will be equally divided into three groups, i.e. Group A, Group B and Group C. As per their previous term examination result, students will be classified as low achievers & high achievers. Each group will be consisting of equal high and low achiever students. Before beginning

the study, an institutional ethical committee's approval will be sought, as well as written informed consent from each participant. All students will be guided for the way of study conduct, using 'Google classroom' application, and conduction of the pre and post tests. Pre test form consisting of 20 Multiple Choice Questions will be distributed and collected from each student before teaching.

'*Glaucoma*' will be taken as study topic. In Group A, topic will be taught by Conventional method, in Group B it will be taught by Online teaching method using Google classroom, and in group C it will be taught by blended method of teaching. The topic will be completed in three sessions (each of an hour) for each group. Then post test form consisting of 20 Multiple Choice Questions will be distributed and filled up by the participants.

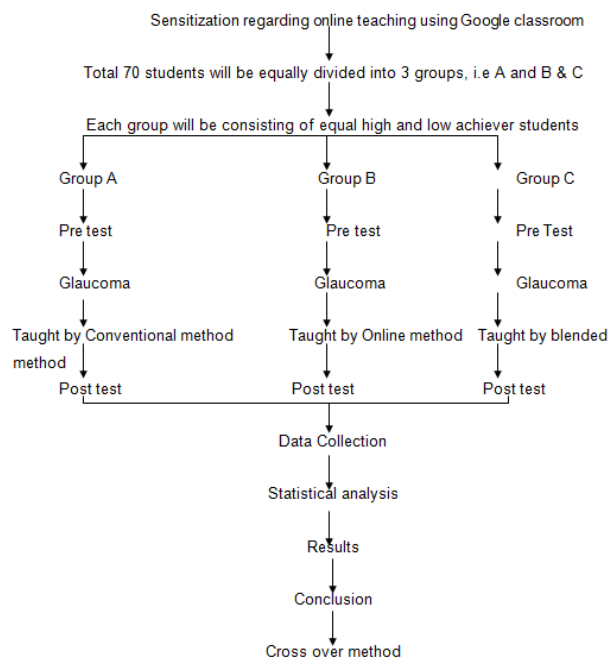
A crossover method will be adopted, for the rotation of the classes, so that all three groups will be taught by all three methods, as shown in Table 1.

Table 1. Grouping of teaching methods

| Topic | Group A | Group B | Group C |
|--|--------------|--------------|--------------|
| Glaucoma in general | Conventional | Online | Blended |
| Congenital and developmental Glaucoma and PACG | Blended | Conventional | Online |
| POAG and Secondary Glaucoma | Online | Blended | Conventional |

PACG- Primary angle closure glaucoma; POAG- Primary open angle glaucoma

3.5 Chart 1: Study design



3.6 Data Collection

The data will be collected from the scores obtained from pre test and post test forms submitted by the students.

Table 2. Questions related to Topic – Glaucoma general

| | |
|--|---|
| 1. Which of the following is not included in the Definition of Glaucoma? | a. Raised IOP b. Optic disc changes c. Visual field changes d. Dilatation of pupils |
| 2. The Eye with Glaucomatous cupping and visual field defect, but normal or low IOP, is said to be having? | a. NTG (Normal tension glaucoma) b. LTG (Low tension glaucoma) c. Both a and b d. None of these |
| 3. Eyes with constant Raised IOP, with no other signs of Glaucoma, is said to have? | a. NTG b. LTG c. Both a and b d. Ocular hypertension |
| 4. Glaucoma at the time of birth is called? | a. Primary congenital b. true congenital c. Secondary congenital d. Developmental |
| 5. Glaucoma not due to any other causative disease, is called? | a. Primary b. Secondary c. Independent d. Idiopathic |
| 6. Open angle and Angle closure glaucomas are included in which type? | a. Primary b. Secondary c. Mixed d. Both a and b |
| 7. The Glaucoma due to Hypermature cataract, can be included in? | a. Open angle glaucoma b. Angle closure glaucoma c. Lens induced glaucoma d. Inflammatory glaucoma |
| 8. The Glaucoma due to Uveitis, can be included in? | a. Open angle glaucoma b. Angle closure glaucoma c. Lens induced glaucoma d. Inflammatory glaucoma |
| 9. The pigments in the pigmentaryglaucoma are released from? | a. Iris b. Lens capsule c. Zonules d. Unknown source |
| 10. glaucoma due to removal of lens is called? | a. Lens induced glaucoma b. Aphakic glaucoma c. Pseudophakic glaucoma d. Phacolytic glaucoma |
| 11. The RGCs dies due to lack of? | a. Growth hormone b. Neurotrophins c. Stimulations d. Light reflex |
| 12. Which of the following is not a type of congenital glaucoma? | a. True congenital b. false congenital c. Infantile d. Juvenile |
| 13. Which of the following is not a types of Adult glaucoma | a. PLCG b. POAG c. PACG d. Mixed |

| | |
|--|---|
| 14. The corneal sign in Glaucoma can be? | a. Corneal opacity b. Corneal ulcer c. Corneal Edema d. Corneal degeneration |
| 15. The pupils in Glaucoma will be? | a. Reacting pupils b. Sluggish pupils c. Brisk pupils d. Pin pointed pupils |
| 16. The example of 'Beta blocker' used in Glaucoma | a. Acetazolamide b. Mannitol c. Timolol d. Travoprost |
| 17. The example of 'Prostaglandin analogue' used in Glaucoma | a. Acetazolamide b. Mannitol c. Timolol d. Travoprost |
| 18. The example of 'Osmotic dehydrant' used in Glaucoma | a. Acetazolamide b. Mannitol c. Timolol d. Travoprost |
| 19. What are the types of filtering operations for Glaucoma? | a. SICS b. Phacoemulsification c. Trabeculectomy d. AC shunt |
| 20. Indication for Cyclo destruction is? | a. Painful eye b. Blind eye c. Both d. None |

Table 3. Questions related to Topic – Congenital and developmental Glaucoma and PACG

| | |
|---|--|
| 1. Glaucoma in children with Primary disease as glaucoma is? | a. Congenital glaucoma b. Developmental glaucoma c. Both a and b d. None of these |
| 2. In True congenital glaucoma, Raised IOP is in the age of? | a. Intra Uterine life b. At the time of birth c. Within one month of birth d. None of these |
| 3. True congenital glaucoma; comprises how much of congenital glaucoma cases? | a. 20% b. 40% c. 60% d. 80% |
| 4. Infantile glaucoma, comprises how much of congenital glaucoma cases? | a. 10% b. 20% c. 50% d. 60% |
| 5. Infantile glaucoma arises before? | a. First year of life b. Second year of life c. Third year of life d. Fourth year of life |
| 6. Juvenile glaucoma arises between? | a. 1-2 year of life b. 2-12 years of life c. 3-16 years of life d. 4-20 years of life |
| 7. Infantile glaucoma, comprises how much of congenital glaucoma cases? | a. 10% b. 20% |

| | |
|---|---|
| | c. 50% |
| | d. 60% |
| 4. Glaucoma at the time of birth is called? | a. Primary congenital b. true congenital c. Secondary congenital d. Developmental |
| 5. Glaucoma not due to any other causative disease, is called? | a. Primary b. Secondary c. Independent d. Idiopathic |
| 6. Open angle and Angle closure glaucomas are included in which type? | a. Primary b. Secondary c. Mixed d. Both a and b |
| 7. The term Buphthalmos means? | a. Bull like eyes b. Ball like eyes c. Bulb like eyes d. Brisk eyes |
| 8. The Prevalence of congenital glaucoma is? | a. 1 in 10,000 b. 2 in 10,000 c. 3 in 10,000 d. 4 in 10,000 |
| 9. The Bilateral cases out of total cases of congenital glaucoma are? | a. 25% b. 50% c. 75% d. 100% |
| 10. Glaucoma due to removal of lens is called? | a. Lens induced glaucoma b. Aphakic glaucoma c. Pseudophakic glaucoma d. Phacolytic glaucoma |
| 11. The factor in the pathogenesis of congenital glaucoma is? | a. Flat iris insertion b. Trabecular dysgenesis c. both a and b d. None of these |
| 12. Eyes which are more prone to Glaucoma, are having? | a. Myopia b. Hypermetropia c. Astigmatism d. Pressbyopia |
| 13. Flat iris plane with shallow angle of anterior chamber, is called? | a. Flat iris b. Plateu iris c. Shallow iris d. Deep iris |
| 14. Male: Female ratio in PACG? | a. 1:1 b. 1:2 c. 1:3 d. 1:4 |
| 15. The Collection of Aqueous under iris, due to posterior synachae, is called? | a. Flat iris b. Plateu iris c. Shallow iris d. Iris Bombe |
| 16. The eyes with occludable angles and shallow AC, but no symptoms, are having? | a. PACG suspect b. POAG suspect c. Subacute PACG d. Acute PACG |
| 17. The condition in which, even physiological mydriasis raises the IOP, is called? | a. PACG suspect b. POAG suspect c. Subacute PACG |

| | |
|---|--|
| 18. Sudden total angle closure causes a significant increase in IOP, is called? | d. Acute PACG a. PACG suspect b. POAG suspect c. Subacute PACG d. Acute PACG |
| 19. Post congestive Glaucoma can represent as? | a. Spontaneous angle opening b. Chronic congestive glaucoma c. Ciliary body shut down d. All of these |
| 20. Which of the following is not in Vogt's triad? | a. Glaucomflacken b. patches of iris atrophy c. Slightly dilated non reacting pupils d. Severe Headache |

Students Perception Form:

Gender : Male Female

Roll No. :

Contact number :

1. What is your opinion about E learning?
2. Which method of E learning is better for understanding of the topic and why?
 - a. Online Teaching
 - b. Conventional Teaching
 - c. Blended Learning
3. What are the advantages & disadvantages of Conventional Teaching?

Advantages -

Disadvantages -
4. What are the advantages & disadvantages of Online Teaching?

Advantages -

Disadvantages –
5. What are the advantages & disadvantages of Blended Teaching?

Advantages -

Disadvantages –

Table 4. Answer the following questions with reference to the options of a- Strongly disagree; b - Disagree; c - Neutral; d - Agree; e - Strongly agree

| Sr. No. | Items | A | b | C | d | e |
|---------|---|---|---|---|---|---|
| 1. | The Online Teaching method enabled me to meet the objectives of the Topic taken. | | | | | |
| 2. | The Conventional Teaching method enabled me to meet the objectives of the Topic taken. | | | | | |
| 3. | The Blended Teaching method enabled me to meet the objectives of the Topic taken. | | | | | |
| 4. | Online Teaching method create good impact on my way of understanding the diagnosis and treatment plan for the diseases | | | | | |
| 5. | Conventional Teaching method create good impact on my way of understanding the diagnosis and treatment plan for the diseases | | | | | |
| 6. | Blended Teaching method create good impact on my way of understanding the | | | | | |

| Sr. No. | Items | A | b | C | d | e |
|---------|---|---|---|---|---|---|
| | diagnosis and treatment plan for the diseases | | | | | |
| 7. | Online Teaching method is good for development of abilities and skill in students | | | | | |
| 8. | Conventional Teaching method is good for development of abilities and skill in students | | | | | |
| 9. | Blended Teaching method is good for development of abilities and skill in students | | | | | |
| 10. | Conventional Teaching method gave me an opportunity to clarify the areas of confusion by asking questions to the facilitator (teacher) | | | | | |
| 11. | Online Teaching method gave me a chance to improve my knowledge by discussing on knowledge deficient areas with other students | | | | | |
| 12. | Blended teaching method gave me a chance to improve my knowledge by discussing on knowledge deficient areas with other students | | | | | |
| 13. | Conventional Teaching method helped me to improve independent learning | | | | | |
| 14. | The Online Teaching method enabled me to meet the objectives of the Topic taken. | | | | | |
| 15. | The Blended Teaching method enabled me to meet the objectives of the Topic | | | | | |

3.7 Statistical Test

The effectiveness will be assessed by the pre and post test scores of students. Data will be analyzed by using appropriate statistical analysis.

4. RESULTS

The results will be drawn from the analysis of the data, obtained from the three groups.

5. DISCUSSION

Gone are the days, when the education used to be only study centric. In current times, education is regarded as something which should help in overall and complete, mental and physical, development of the students [8].

Students, teachers other nonteaching members of the institutions providing higher education are getting familiar with the online teaching methods, applications, technical modalities, and issues with it. In response to these changes in the prevention policies of COVID-19, several institutions have been developing strategic plans for implementing online learning. The online teaching method took a big leap in solving the problems of distant learning. Also, it is cheaper,

adoptable, and time saving. The data obtained can be easily saved, modified, and transferred. However, myths and misconceptions about the difficulty of online teaching and learning, as well as the technologies available to support online instruction, persist, and the problems faced by students, create challenges for planning documents. Hence, the present study is planned at comparing degree of understanding a particular topic by students using conventional teaching, online teaching, and blended teaching methods.

Study conducted by Kyong-Jee Kim et al., indicated that Blended learning, rather than fully online learning, may be a more significant growth area. Follow-up studies could focus on aspects of blended learning that institutions need to address, such as types of blended learning, activities that lead to blended-learning success, and blended-learning instructor training. In another study Staker H et al., stated the six models of blended learning are as follows: (a) Face-to-Face driven model, in which classroom learning is supplemented with online learning. (b) Rotation model, in which students alternate between working online and in other classroom-based modalities. (c) Flex model, in which students study primarily online according to an

individually tailored schedule and receive face-to-face support as needed. (d) The online lab model, in which students supplement their traditional studies by taking an additional online course on campus. (e) The self-blend model, in which students supplement their traditional studies by taking an additional online course off campus. (f) The enriched virtual model, in which students learn primarily online with occasional visits to a brick and mortar setting for face-to-face tuition. In this study effectiveness of Flex model of Blended learning will be studied. Kintu et al. [9] stated that, the majority of the student characteristics and blended learning design features discussed in this study are important factors in the effectiveness of blended learning. There were no significant predictors of student performance among the independent variables. These gaps should be investigated further to see if they can be used to predict blended learning effectiveness in a similar or different learning environment [9,10].

6. CONCLUSION

Considering the current situation and if found effective, educational institutions must adopt blended teaching method over traditional and online teaching method to the larger benefit of learners.

CONSENT

The volunteers will be informed about the study protocol. Educational research format will be prepared and validated. Informed written consent of each participant will be obtained prior to study.

ETHICAL APPROVAL

Ethical approval will be taken prior to the study.

ACKNOWLEDGEMENT

Author would like to thank DMIMSU for motivating and providing all necessary help for writing this article.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Ferrel MN, Ryan JJ. The impact of COVID-19 on medical education. *Cureus*. 2020;12:e7492.
2. Allen EI, Seaman J. Growing by degrees: Online Education in the United States, 2005 (Needham, Mass.: The Sloan Consortium, 2005); 2005.
3. Jung I, Rha I. Effectiveness and cost-effectiveness of online education: A review of the literature. *Educational Technology*. 2000;40(4):57–60.
4. Olson TM, Wisner RA. The effectiveness of web based instruction: An initial inquiry. *International Review of Research in Open and Distance Learning*. 2002;3(2).
5. Hill JR, Wiley D, Nelson LM, Han S. Exploring research on Internet-based learning: From infrastructure to interactions. In *Handbook of Research on Educational Communications and Technology*. 2013;11:437-464.
6. Jonassen DH. Editor, *Handbook of Research for Educational Communications and Technology* (2nd ed.). 2020;433–460.
7. Rathi B, Rathi R. Evaluation of second year BAMS student's perception and feedback on teaching learning methods of Rasashastra and Bhaishajya Kalpana. *Joinsysmed*. 2017;15(4):279-285.
8. Rathi R, Rathi B. Evaluation of third year BAMS students perception and feedback on Teaching-Learning Methods of Kaumarbhritya. *Journal of Indian System of Medicine*, 2018; 6(3):130.
9. Rathi B. Conventional methods and educational tour in enhancing the practical skills in Rasashastra & Bhaishajya Kalpana: A randomized comparative study. *JHSE*. 2016;3(1):15-21.
10. Kintu MJ, Zhu C, Kagambe E. Blended learning effectiveness: The relationship between student characteristics, design features and outcomes. *International Journal of Educational Technology in Higher Education*. 2017;14(1):1-20.