

Assessment of Student's Perceptions for Audio-visual Aids in Dentistry

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Abstract

Background: Teachers have conventionally been using different teaching methods to educate dental students by blackboard and slide projectors. It is very important for any dental teacher to meet the educational need of the students regarding their knowledge, attitude and skills. Audiovisual (AV) aids help the conventional teaching methods like a Blackboard (BB), overhead projector (OHP), power point presentation (PPT), audiotapes and film loops. The present study was an attempt to assess the student's perceptions for the use of AV aids in teaching dental subjects.

Materials and Methods: A questionnaire based analytical cross-sectional study was carried out among 500 dental students attending lectures in a regional dental college, Bhimavaram, A.P. Students were made familiar with all the dental subjects and exposed to different AV aids like blackboard, OHP and PPT, used for lecture delivery. Various parameters were included in the questionnaire forms to evaluate the student's perception for AV aids during teaching dental subjects. The data collected was analyzed using Statistical Package for Social Sciences (SPSS) version 20. **Results:** The questionnaire provided was found to be reliable with Cronbach's α value of 0.774. 70.6% of students showed interest in taking notes rather than taking handouts [29.4%]. Students reported that all the dental subjects were effectively taught using PPT followed by BB except for Biochemistry and Pharmacology. The perception of diagrams, flowcharts and note taking was best accepted with a PPT followed by BB, lectures were clear, understandable, well-organized and students were stimulated by PPT for further reading. **Conclusion:** Our study showed that lectures delivered using PPT were more appreciated by the students followed by BB and narration. OHP was the least preferred method by the dental students.

Keywords: Audio-visual aids; Lecture; Dental students; Perception

Introduction

The word "lecture" is derived from the Latin word "lectus" which means "oral discourse on a given subject before an audience for purposes of instruction." They are a one-way delivery of information that may be interrupted by questions and perhaps even some discussion. They are especially useful when a large number of learners must be taught at one time and are powerful techniques for getting across a large amount of theoretical information. The other strength of lectures is the ability to support a complementary study of books or other material, by amplifying or explaining key points. Thus, a well-organized lecture remains one of the most effective ways to integrate and organize information from multiple sources on complex topics [1].

Lectures still remain the most common mode of instruction in higher education. The basic aim of education must be to lead students towards self-learning and lifelong learning and this aim can be achieved through the use of audio-visual aids as it improves the learning capacities of individual students. Students learn from lectures by listening, observing, summarizing and note taking. The traditional didactic lecture is more passive in nature and less effective as a teaching tool compared with active learning methods. Hence, assistance in the form of audio-visual aid is needed to enhance the quality of a lecture [2]. The effectiveness of the lecture also depends upon the teacher,

regardless of the teaching aid used [3]. Maximum benefit of AV aids is obtained only in conjunction with a well-structured lecture by a teacher having good interactive and teaching skills.

Delivering a lecture is made easy and better by use of audiovisual aids (AV aids) such as blackboard or whiteboard, an overhead projector (OHP), and PowerPoint presentation (PPT) [4]. Chalkboard aid is inexpensive; easy to clean and reuse, allows students to keep pace with the teacher and is not dependent on electricity. But it is time consuming; one cannot go back to what has been erased and is not so effective for a large number of students [5,6].

Audio-visual (AV) aids are most effective tools for developing flawless communication and interaction between student and content as well as student and teacher. These aids not only help to save teacher's time but also help in developing and arousing curiosity, creativity and motivation. It emphasizes on the comprehension of knowledge and concept as well as keeps

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working on developing sound foundations for higher and further studies.

Different subjects ranging from preclinical and basic sciences such as Anatomy/ Dental Anatomy, Physiology, Biochemistry to paramedical subjects like Pharmacology, Pathology/ Oral Pathology, Microbiology and clinical subjects like Oral Medicine, Endodontics are taught to undergraduate [UG] dental students in India. The training program in UG teaching uses a judicious mixture of didactic lectures with audiovisual aids, clinical teaching, case- based learning and practical experiments.

AV aids keep the individual learner focused/attentive, retains interest till the end of the session, makes more realistic and dynamic, increases the retention rate of the subject, motivates the individual to think, speak and interact without fear and hesitation resulting in student's personality development. It is also believed that AV aids carry a high rate of attractiveness that results in a student being diverted from the desired path of learning [7].

Most of the studies were done in medical students to assess the use of audiovisual aids in subjects like pharmacology, microbiology, biochemistry but no studies were done to assess the use of AV aids during teaching dental subjects. Seth et al. [8] noted that the majority of the medical students preferred PPT presentations while dental students preferred chalkboard. Mohan et al. [4] noted that the optimum use of AV aid is essential for deriving their benefits.

Dental student's needs are changing and the role of educators is being redefined at the same time. Thus, one has to keep pace with the ever-changing needs of the students and changing trends. Moreover, it is necessary to note here that the students represent the population which differs in age, place, ethnicity, the level of preparedness, learning styles and preferences. It is likely that mismatch may exist between student's learning styles and the teaching styles of teachers. Moreover, no studies were accessed which were performed to assess the student's views on the use of AV aids in teaching dental subjects. So the present study was done to assess the dental student's perceptions for the use of audiovisual aids in dental education.

Aims and Objectives

To explore dental students perception about the use of audio-visual aids in lecture delivery so as to improve their effective use in dental education

Materials and Methods

This Cross-sectional, self-administered, pre-structured questionnaire based study was conducted among 500 dental students including girls and boys of age 17-30 years studying in Vishnu Dental College, Bhimavaram, Andhra Pradesh. The students willing to participate were included with their consent. Students were made familiar with all the dental subjects and were exposed to different AV aids used for lecture delivery. The questionnaire forms which were incompletely filled were excluded.

The questionnaire consists of socio- demographic profile and

was constructed to assess views regarding audio-visual aids used in this college during lecture classes. The audio-visual aids used were Black/white board, Over-head projector, Power point. In our college, we don't use combination aids frequently, hence we did not include combination aids as one of the comparative arms. The questionnaire was based on a review of the literature and similar studies conducted elsewhere. The students were encouraged to furnish their unbiased independent opinion to complete the questionnaires regarding the study. Students were instructed to select appropriate teaching aids for each item in the questionnaire and give their overall opinion regarding the best teaching aid they preferred for all the dental subjects taught during their under graduation. After one month, 30 questionnaire forms were given to same students to fill to check the intra-item correlation.

Results

The data was analyzed by the statistical package for the social sciences computer software (SPSS, version 20.0, SPSS Inc., Chicago, IL, USA). The comparison of the preferences of visual aids with respect to year of study, gender, and schooling was done by descriptive statistics. Crosstabs were made to find an association among various discrete variables and a chi-square test was used to find the significance of the association. To find out the reliability, Intra class correlation, Cronbach's alpha and Wilcoxon signed rank tests were used. P values less than 0.05 were considered to be statistically significant.

Out of total sample [500], 99 males and 401 females studying first BDS [89], second BDS [92], third BDS [70], Fourth BDS [82], Interns [45] and postgraduates [122] belonging to 17 to 30 years were included in the study after obtaining the informed verbal consent. Most of them studied in private school [93%] compared to Government school [7%] in English medium [94%] through blackboard [70.8%].

70.6% of students showed interest in taking notes rather than taking handouts [29.4%]. Students reported that all the subjects were effectively taught using PPT followed by BB except for Biochemistry and Pharmacology, which were effective by BB teaching as shown in Figure 1. 58.8% of students opinioned to take notes by PPT followed by BB [24.2%]. In the present study, OHP and narration were least preferred teaching aids for all parameters [Tables 1-3].

The perception of diagrams, flowcharts and note taking was best accepted with PPT followed by BB, lectures were clear, understandable, well organized and students were active and stimulated for further reading by PPT. This study showed that students were attentive; self-motivated by PPT lectures followed by BB but more interactive lectures were by BB followed by narration [Tables 4 and 5]. All the parameters assessed by students were better appreciated by PPT except that student's problems were solved better with the use of BB followed by PPT. [Table 6 and Figure 1]. They also reported that more amount of subject was covered per lecture and better recalled by PPT [Table 7]. We also studied about the overall opinion of students towards the best teaching aid and found that 75.6% of students preferred PPT, 13.2% BB, 5.8% Narration and 5.4% OHP [Table 8].

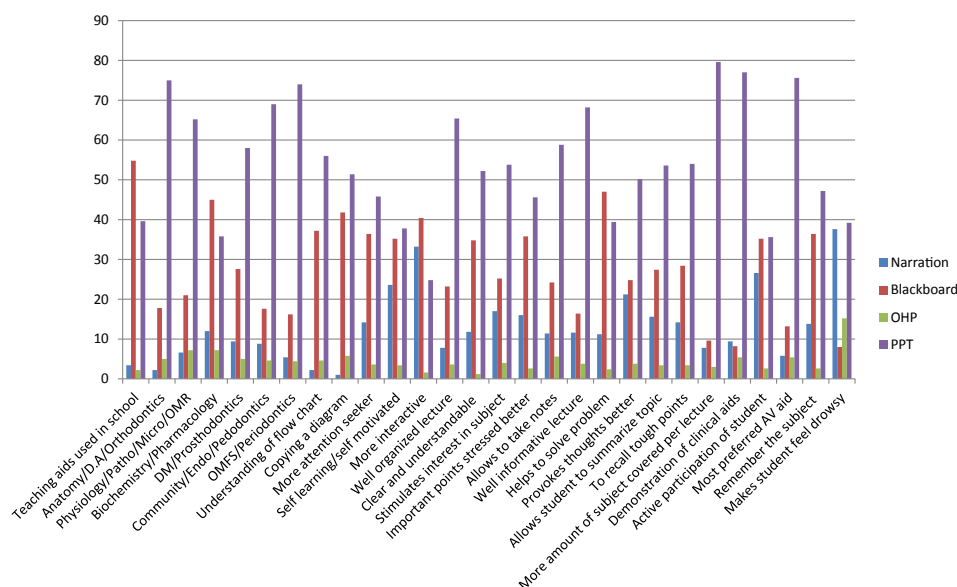


Figure 1: Percentage distribution of various parameters assessed by students for audio-visual aids.

Table 1: Percentage distribution of various parameters assessed for effectiveness of teaching aids in dentistry.

Which AV aid is effective for	Narration N (%)	Blackboard N (%)	OHP N (%)	PPT N (%)
Anatomy/D.A/Orthodontics	11 (2.2)	89 (17.8)	25 (5)	375 (75)
Physiology/Patho/Micro/OMR	33 (6.6)	105 (21)	36 (7.2)	326 (65.2)
Biochemistry/Pharmacology	60 (12)	225 (45)	36 (7.2)	179 (35.8)
DM/Prosthodontics	47 (9.4)	138 (27.6)	25 (5)	290 (58)
Community/Endo/Pedodontics	44 (8.8)	88 (17.6)	23 (4.6)	345 (69)
OMFS/Periodontics	27 (5.4)	81 (16.2)	22 (4.4)	370 (74)
Understanding of flow chart	11 (2.2)	186 (37.2)	23 (4.6)	280 (56)
Copying a diagram	5 (1)	209 (41.8)	29 (5.8)	257 (51.4)
More attention seeker	71 (14.2)	182 (36.4)	18 (3.6)	229 (45.8)
Self-learning/self-motivated	118 (23.6)	176 (35.2)	17 (3.4)	189 (37.8)
More interactive	166 (33.2)	202 (40.4)	8 (1.6)	124 (24.8)
Well organized lecture	39 (7.8)	116 (23.2)	18 (3.6)	327 (65.4)
Clear and understandable	59 (11.8)	174 (34.8)	6 (1.2)	261 (52.2)
Stimulates interest in subject	85 (17)	126 (25.2)	20 (4)	269 (53.8)
Important points stressed better	80 (16)	179 (35.8)	13 (2.6)	228 (45.6)
Allows to take notes	57 (11.4)	121 (24.2)	28 (5.6)	294 (58.8)
Well informative lecture	58 (11.6)	82 (16.4)	19 (3.8)	341 (68.2)
Helps to solve problem	56 (11.2)	235 (47)	12 (2.4)	197 (39.4)
Provokes thoughts better	106 (21.2)	124 (24.8)	19 (3.8)	251 (50.2)
Allows student to summarize topic	78 (15.6)	137 (27.4)	17 (3.4)	268 (53.6)
To recall tough points	71 (14.2)	142 (28.4)	17 (3.4)	270 (54)
More amount of subject covered per lecture	39 (7.8)	48 (9.6)	15 (3)	398 (79.6)
Demonstration of clinical aids	47 (9.4)	41 (8.2)	27 (5.4)	385 (77)
Active participation of student	133 (26.6)	176 (35.2)	13 (2.6)	178 (35.6)
Most preferred AV aid	29 (5.8)	66 (13.2)	27 (5.4)	378 (75.6)
Remember the subject	69 (13.8)	182 (36.4)	13 (2.6)	236 (47.2)
Makes student feel drowsy	188 (37.6)	40 (8)	76 (15.2)	196 (39.2)

Table 2: Student's preference of visual aids for various subjects of dentistry.

Year of study	Teaching aids in schooling				Effective for Anatomy & D. A & D.H & Orthodontics				Physiotherapy & Pathology & Microbiology & Oral Medicine				Biochemistry & Pharmacology			
	NR N (%)	BB N (%)	OHP N (%)	PPT N (%)	NR N (%)	BB N (%)	OHP N (%)	PPT N (%)	NR N (%)	BB N (%)	OHP N (%)	PPT N (%)	NR N (%)	BB N (%)	OHP N (%)	PPT N (%)
1 BDS	3 (3.4)	54 (60.7)	1 (1.1)	31 (34.8)	2 (2.2)	9 (10.1)	3 (3.4)	75 (84.3)	8 (9)	20 (22.5)	5 (5.6)	56 (62.9)	15 (16.9)	47 (52.8)	3 (3.4)	24 (27)
2 BDS	4 (4.3)	51 (55.4)	4 (4.3)	33 (35.9)	1 (1.1)	14 (15.2)	3 (3.3)	74 (80.4)	7 (7.6)	19 (20.7)	11 (12)	55 (59.8)	6 (6.5)	50 (54.3)	9 (9.8)	27 (29.3)
3 BDS	3 (4.3)	44 (62.9)	1 (1.4)	22 (31.4)	3 (4.3)	9 (12.9)	1 (1.4)	57 (81.4)	5 (5.7)	5 (7.1)	5 (7.1)	56 (80)	22 (31.4)	21 (30)	8 (11.4)	19 (27.1)
4 BDS	0	47 (57.3)	0	35 (42.7)	3 (3.7)	20 (24.4)	4 (4.9)	55 (67.1)	4 (4.9)	34 (41.5)	3 (3.7)	41 (50)	5 (6.1)	53 (64.6)	2 (2.4)	22 (26.8)

IN-TERNS	6 (13.3)	23 (51.1)	0	16 (35.6)	0	17 (37.8)	7 (15.6)	21 (46.7)	6 (13.3)	5 (11.1)	5 (11.1)	29 (64.4)	4 (8.9)	23 (51.1)	7 (15.6)	11 (24.4)
PG'S	1 (8%)	55 (45.1)	5 (4.1)	61 (50)	2 (1.6)	20 (16.4)	7 (5.7)	93 (76.2)	4 (3.3)	22 (18)	7 (5.7)	89 (73)	8 (6.6)	31 (25.4)	7 (5.7)	76 (62.3)
Total	17 (3.4)	274 (54.8)	11 (2.2)	198 (39.6)	11 (2.2)	89 (17.8)	25 (5)	375 (75)	33 (6.6)	105 (21)	36 (7.2)	326 (65.2)	60 (12)	225 (45)	36 (7.2)	179 (35.8)
P value	0.002				0.00				0.00				0.00			

BDS- Bachelor of Dental Surgery; PG's- Post Graduates; N- Number; NR- Narration; BB- Blackboard; OHP-Overhead Projector; PPT-Power Point; *P<0.05 –significant.

Table 3: Student's preference of visual aids for various subjects of dentistry.

Year of study	Dental materials & Prosthodontics				Community Dentistry & Endodontics & Pedodontics				Oral surgery & Periodontics				Better understanding of flowchart			
	NR N (%)	BB N (%)	OHP N (%)	PPT N (%)	NR N (%)	BB N (%)	OHP N (%)	PPT N (%)	NR N (%)	BB N (%)	OHP N (%)	PPT N (%)	NR N (%)	BB N (%)	OHP N (%)	PPT N (%)
1 BDS	11 (12.4)	14 (15.7)	16 (18)	48 (53.9)	15 (16.9)	5 (5.6)	9 (10.1)	60 (67.4)	8 (9)	4 (4.5)	6 (6.7)	71 (79.8)	3 (3.4)	31 (34.8)	3 (3.4)	52 (58.4)
2 BDS	10 (10.9)	40 (43.5)	1 (1.1)	41 (44.6)	2 (2.2)	10 (10.9)	6 (6.5)	74 (80.4)	0	5 (5.4)	6 (6.5)	81 (88)	0	27 (29.3)	6 (6.5)	59 (64.1)
3 BDS	7 (10)	26 (37.1)	0	37 (52.9)	5 (7.1)	6 (8.6)	0	59 (84.3)	8 (11.4)	6 (8.6)	2 (2.9)	54 (77.1)	0	18 (25.7)	2 (2.9)	50 (71.4)
4 BDS	4 (4.9)	28 (34.1)	2 (2.4)	48 (58.5)	6 (7.3)	33 (40.2)	3 (3.7)	40 (48.8)	4 (4.9)	32 (39)	3 (3.7)	43 (52.4)	2 (2.4)	39 (47.6)	2 (2.4)	39 (47.6)
INTERNS	5 (11.1)	18 (40)	2 (4.4)	20 (44.4)	7 (15.6)	18 (40)	1 (2.2)	19 (42.2)	3 (6.7)	17 (37.8)	2 (4.4)	23 (51.1)	1 (2.2)	32 (71.1)	1 (2.2)	11 (24.4)
PG'S	10 (8.2)	12 (9.8)	4 (3.3)	96 (78.7)	9 (7.4)	16 (13.1)	4 (3.3)	93 (76.2)	4 (3.3)	17 (13.9)	17 (13.9)	98 (8.3)	5 (4.1)	39 (32)	9 (7.4)	69 (56.6)
Total	47 (9.4)	138 (27.6)	25 (5)	290 (58)	44 (8.8)	88 (17.6)	23 (4.6)	345 (69)	27 (5.4)	81 (16.2)	81 (16.2)	370 (74)	11 (2.2)	186 (37.2)	23 (4.6)	280 (56)
P value	0.000				0.000				0.000				0.000			

BDS- Bachelor of Dental Surgery; PG's- Post Graduates; N- Number; NR- Narration; BB- Blackboard; OHP-Overhead Projector; PPT-Power Point; *P<0.05 –significant.

Table 4: Student's preference for various parameters for assessing AV aids during lecture delivery.

Year of study	Copying a diagram				More attention seeker				Directs self-learning /self-motivated				More interactive			
	NR N (%)	BB N (%)	OHP N (%)	PPT N (%)	NR N (%)	BB N (%)	OHP N (%)	PPT N (%)	NR N (%)	BB N (%)	OHP N (%)	PPT N (%)	NR N (%)	BB N (%)	OHP N (%)	PPT N (%)
1 BDS	1 (1.1)	51 (57.3)	6 (6.7)	31 (34.8)	17 (19.1)	12 (13.5)	9 (10.1)	51 (57.3)	29 (32.6)	20 (22.5)	7 (7.9)	33 (37.1)	40 (44.9)	28 (31.5)	3 (3.4)	18 (20.2)
2 BDS	0	42 (45.7)	6 (6.5)	44 (47.8)	8 (8.7)	32 (34.8)	4 (4.3)	48 (52.2)	18 (19.6)	27 (29.3)	3 (3.3)	44 (47.8)	28 (30.4)	33 (35.9)	1 (1.1)	30 (32.6)
3 BDS	0	26 (37.1)	4 (5.7)	40 (57.1)	15 (21.4)	21 (30)	1 (1.4)	33 (47.1)	19 (27.1)	25 (35.7)	2 (2.9)	24 (34.3)	34 (48.6)	19 (27.1)	0	17 (24.3)
4 BDS	0	27 (32.9)	3 (3.7)	52 (63.4)	9 (11)	47 (57.3)	1 (1.2)	25 (30.5)	23 (28)	39 (47.6)	1 (1.2)	19 (23.2)	23 (28)	45 (54.9)	0	14 (17.1)
IN-TERNS	1 (2.2)	31 (68.9)	1 (2.2)	12 (26.7)	7 (15.6)	22 (48.9)	3 (6.7)	13 (28.9)	8 (17.8)	25 (55.6)	2 (4.4)	10 (22.2)	11 (24.4)	27 (60)	3 (6.7)	4 (8.9)
PG'S	3 (2.5)	32 (26.2)	9 (7.4)	78 (63.9)	15 (12.3)	48 (39.3)	0	59 (48.4)	21 (17.2)	40 (32.8)	2 (1.6)	59 (48.4)	30 (24.6)	50 (41)	1 (8)	41 (33.6)
Total	5 (1)	209 (41.8)	29 (5.8)	257 (51.4)	71 (14.2)	182 (36.4)	18 (3.6)	229 (45.8)	118 (23.6)	176 (35.2)	17 (3.4)	189 (37.8)	166 (33.2)	202 (40.4)	8 (1.6)	124 (24.8)
P value	0.000				0.000				0.000				0.000			

BDS- Bachelor of Dental Surgery; PG's- Post Graduates; N- Number; NR- Narration; BB- Blackboard; OHP-Overhead Projector; PPT-Power Point; *P<0.05 –significant.

Table 5: Student's preference for various parameters for assessing AV aids during lecture delivery.

Year of study	Lectures well organized				Lectures clear & understandable				Stimulates interest in subject				Important points stressed in lecture			
	NR N (%)	BB N (%)	OHP N (%)	PPT N (%)	NR N (%)	BB N (%)	OHP N (%)	PPT N (%)	NR N (%)	BB N (%)	OHP N (%)	PPT N (%)	NR N (%)	BB N (%)	OHP N (%)	PPT N (%)
1 BDS	7 (7.9)	8 (9)	6 (6.7)	68 (76.4)	13 (14.6)	22 (24.7)	2 (2.2)	52 (58.4)	9 (10.1)	15 (16.9)	9 (10.1)	56 (62.9)	23 (25.8)	29 (32.6)	4 (4.5)	33 (37.1)
2 BDS	4 (4.3)	22 (23.9)	6 (6.5)	60 (65.2)	7 (7.6)	34 (37)	1 (1.1)	50 (54.3)	13 (14.1)	10 (10.9)	3 (3.3)	66 (71.7)	14 (15.2)	36 (39.1)	3 (3.3)	39 (42.4)
3 BDS	6 (8.6)	14 (20)	1 (1.4)	49 (70)	9 (12.9)	19 (27.1)	0	42 (60)	20 (28.6)	14 (20)	3 (4.3)	33 (47.1)	14 (20)	16 (22.9)	0	40 (57.1)

4 BDS	9 (11)	31 (37.8)	1 (1.2)	41 (50)	12 (14.6)	43 (52.4)	0	27 (32.9)	16 (19.5)	37 (45.1)	1 (1.2)	28 (34.1)	15 (18.3)	37 (45.1)	0	30 (36.6)
IN-TERNs	2 (4.4)	22 (48.9)	2 (4.4)	19 (42.2)	5 (11.1)	25 (55.6)	0	15 (33.3)	8 (17.8)	20 (44.4)	2 (4.4)	15 (33.3)	3 (6.7)	21 (46.7)	3 (6.7)	18 (40)
PG'S	11 (9)	19 (15.6)	2 (1.6)	90 (73.8)	13 (10.7)	31 (25.4)	3 (2.5)	75 (61.5)	19 (15.6)	30 (24.6)	2 (1.6)	71 (58.2)	11 (9)	40 (32.8)	3 (2.5)	68 (55.7)
Total	39 (7.8)	116 (23.2)	18 (3.6)	327 (65.4)	59 (11.8)	174 (34.8)	6 (1.2)	261 (52.2)	85 (17)	126 (25.2)	20 (4)	269 (53.8)	80 (16)	179 (35.8)	13 (2.6)	228 (45.6)
P value	0.000				0.000				0.000				0.001			

BDS- Bachelor of Dental Surgery; PG's- Post Graduates; N- Number; NR- Narration; BB- Blackboard; OHP-Overhead Projector; PPT-Power Point; *P<0.05 –significant.

Table 6: Student's preference for various parameters for assessing AV aids during lecture delivery.

Year of study	Allows to take notes				Lecture well informative				Helps to solve the problem better				Provokes thoughts better			
	NR N (%)	BB N (%)	OHP N (%)	PPT N (%)	NR N (%)	BB N (%)	OHP N (%)	PPT N (%)	NR N (%)	BB N (%)	OHP N (%)	PPT N (%)	NR N (%)	BB N (%)	OHP N (%)	PPT N (%)
1 BDS	21 (23.6)	19 (21.3)	3 (3.4)	46 (51.7)	14 (15.7)	13 (14.6)	5 (5.6)	57 (64)	8 (9)	51 (57.3)	4 (4.5)	26 (29.2)	17 (19.1)	18 (20.2)	10 (11.2)	44 (49.4)
2 BDS	5 (5.4)	21 (22.8)	11 (12)	55 (59.8)	9 (9.8)	7 (7.6)	7 (7.6)	69 (75)	9 (9.8)	46 (50)	2 (2.2)	35 (38)	19 (20.7)	19 (20.7)	3 (3.3)	51 (55.4)
3 BDS	7 (10)	4 (5.7)	3 (4.3)	56 (80)	10 (14.3)	14 (20)	2 (2.9)	44 (62.9)	9 (12.9)	27 (38.6)	2 (2.9)	32 (45.7)	16 (22.9)	19 (27.1)	1 (1.4)	34 (48.6)
4 BDS	10 (12.2)	24 (29.3)	3 (3.7)	45 (54.9)	13 (15.9)	23 (28)	3 (3.7)	43 (52.4)	12 (14.6)	45 (54.9)	2 (2.4)	23 (28)	20 (24.4)	25 (30.5)	2 (2.4)	35 (42.7)
IN-TERNs	2 (4.4)	20 (44.4)	0	23 (51.1)	2 (4.4)	10 (22.2)	1 (2.2)	32 (71.1)	5 (11.1)	19 (42.2)	0	21 (46.7)	10 (22.2)	16 (35.6)	2 (4.4)	17 (37.8)
PG'S	12 (9.8)	33 (27)	8 (6.6)	69 (56.6)	10 (8.2)	15 (12.3)	1 (8)	96 (78.7)	13 (10.7)	47 (38.5)	2 (1.6)	60 (49.2)	24 (19.7)	27 (22.1)	1 (8)	70 (57.4)
Total	57 (11.4)	121 (24.2)	121 (24.2)	294 (58.8)	58 (11.6)	82 (16.4)	19 (3.8)	341 (68.2)	56 (11.2)	235 (47)	12 (2.4)	197 (39.4)	106 (21.2)	124 (24.8)	19 (3.8)	251 (50.2)
P value	0.000				0.003				0.15				0.026			

BDS- Bachelor of Dental Surgery; PG's- Post Graduates; N- Number; NR- Narration; BB- Blackboard; OHP-Overhead Projector; PPT-Power Point; *P<0.05 –significant.

Table 7: Student's preference for various parameters for assessing AV aids during lecture delivery.

Year of study	To summarize topic better				To recall tough points better				More subject covered per lecture				Demonstration of clinical aids better			
	NR N (%)	BB N (%)	OHP N (%)	PPT N (%)	NR N (%)	BB N (%)	OHP N (%)	PPT N (%)	NR N (%)	BB N (%)	OHP N (%)	PPT N (%)	NR N (%)	BB N (%)	OHP N (%)	PPT N (%)
1 BDS	16 (18)	18 (20.2)	7 (7.9)	48 (53.9)	21 (23.6)	15 (16.9)	6 (6.7)	47 (52.8)	11 (12.4)	8 (9)	2 (2.2)	68 (76.4)	19 (21.3)	4 (4.5)	9 (10.1)	57 (64)
2 BDS	14 (15.2)	26 (28.3)	5 (5.4)	47 (51.1)	12 (13)	29 (31.5)	5 (5.4)	46 (50)	11 (12)	4 (4.3)	3 (3.3)	74 (80.4)	7 (7.6)	8 (8.7)	6 (6.5)	71 (77.2)
3 BDS	13 (18.6)	14 (20)	1 (1.4)	42 (60)	12 (17.1)	11 (15.7)	1 (1.4)	46 (65.7)	3 (4.3)	0	1 (1.4)	66 (94.3)	6 (8.6)	5 (7.1)	1 (1.4)	58 (82.9)
4 BDS	15 (18.3)	31 (37.8)	1 (1.2)	35 (42.7)	10 (12.2)	28 (34.1)	2 (2.4)	42 (51.2)	5 (6.1)	14 (17.1)	2 (2.4)	61 (74.4)	5 (6.1)	6 (7.3)	6 (7.3)	65 (79.3)
IN-TERNs	4 (8.9)	21 (46.7)	0	20 (44.4)	6 (13.3)	23 (51.1)	0	16 (35.6)	4 (8.9)	10 (22.2)	4 (8.9)	27 (60)	2 (4.4)	11 (24.4)	2 (4.4)	30 (66.7)
PG'S	16 (13.1)	27 (22.1)	3 (2.5)	76 (62.3)	10 (8.2)	36 (29.5)	3 (2.5)	73 (59.8)	5 (4.1)	12 (9.8)	3 (2.5)	102 (83.6)	8 (6.6)	7 (5.7)	3 (2.5)	104 (85.2)
Total	78 (15.6)	137 (27.4)	17 (3.4)	268 (53.6)	71 (14.2)	142 (28.4)	17 (3.4)	270 (54)	39 (7.8)	48 (9.6)	15 (3.0)	398 (79.6)	47 (9.4)	41 (8.2)	27 (5.4)	385 (77)
P value	0.007				0.000				0.000				0.000			

BDS- Bachelor of Dental Surgery; PG's- Post Graduates; N- Number; NR- Narration; BB- Blackboard; OHP-Overhead Projector; PPT-Power Point; *P<0.05 –significant.

Table 8: Student's preference for various parameters for assessing AV aids during lecture delivery.

Year of study	Active participation in lecture				Most preferred aid				Remember subject better				Student feel drowsy/bored			
	NR N (%)	BB N (%)	OHP N (%)	PPT N (%)	NR N (%)	BB N (%)	OHP N (%)	PPT N (%)	NR N (%)	BB N (%)	OHP N (%)	PPT N (%)	NR N (%)	BB N (%)	OHP N (%)	PPT N (%)
1 BDS	33 (37.1)	18 (20.2)	7 (7.9)	31 (34.8)	9 (10.1)	9 (10.1)	7 (7.9)	64 (71.9)	10 (11.2)	19 (21.3)	7 (7.9)	53 (59.6)	52 (58.4)	13 (14.6)	1 (1.1)	23 (25.8)
2 BDS	17 (18.5)	34 (37)	3 (3.3)	38 (41.3)	2 (2.2)	7 (7.6)	8 (8.7)	75 (81.5)	14 (15.2)	35 (38)	2 (2.2)	41 (44.6)	36 (39.1)	10 (10.9)	27 (29.3)	19 (20.7)
3 BDS	21 (30)	18 (25.7)	2 (2.9)	29 (41.4)	3 (4.3)	6 (8.6)	4 (5.7)	57 (81.4)	18 (25.7)	22 (31.4)	0	30 (42.9)	28 (40)	4 (5.7)	9 (12.9)	29 (41.4)

4 BDS	22 (26.8)	44 (53.7)	0	16 (19.5)	6 (7.3)	19 (23.2)	4 (4.9)	53 (64.6)	13 (15.9)	41 (50)	1 (1.2)	27 (32.9)	22 (26.8)	2 (2.4)	7 (8.5)	51 (62.2)
Interns	11 (24.4)	23 (51.1)	1 (2.2)	10 (22.2)	4 (8.9)	15 (33.3)	2 (4.4)	24 (53.3)	5 (11.1)	24 (53.3)	1 (2.2)	15 (33.3)	9 (20)	3 (6.7)	5 (11.1)	28 (62.2)
PG'S	29 (23.8)	39 (32)	0	54 (44.3)	5 (4.1)	10 (8.2)	2 (1.6)	105 (86.1)	9 (7.4)	41 (33.6)	2 (1.6)	70 (57.4)	41 (33.6)	8 (6.6)	27 (22.1)	46 (37.7)
Total	133 (26)	176 (35.2)	13 (2.6)	178 (35.6)	29 (5.8)	66 (13.2)	27 (5.4)	378 (75.6)	69 (13.8)	182 (36.4)	13 (2.6)	236 (47.2)	188 (37.6)	40 (8)	76 (15.2)	196 (39.2)
value	0.000				0.000				0.000				0.000			

BDS- Bachelor of Dental Surgery; PG's- Post Graduates; N- Number; NR- Narration; BB- Blackboard; OHP-Overhead Projector; PPT-Power Point; *P<0.05 –significant.

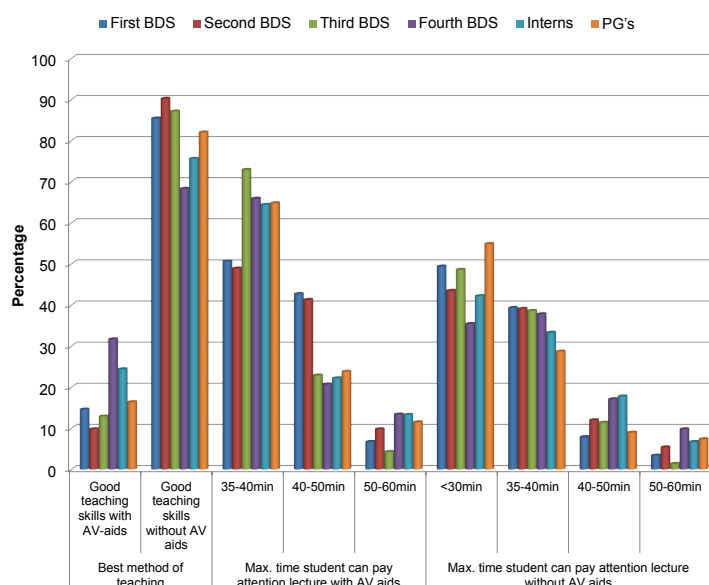


Figure 2: Percentage of students and their opinion regarding teacher's skills and attentive time in lecture.

The reliability of the questionnaire was found to be high with Cronbach's α value of 0.774. Teacher having good teaching skills and AV aids [82%] was preferred most than a teacher with only good teaching skills [18%]. 60.6% of the students expressed that the maximum time they can pay attention to a class taught by a teacher having good teaching skills and AV aids was 35-40 min and to a teacher with only good teaching skills was <30 min [Figure 2].

Discussion

In this study, a self-administered questionnaire was distributed to study the student's perception on the audiovisual aids used in dental education. The majority (54.8%) of the students opted for BB as the most common teaching aid used in school. Most of the student's favored PPT method of teaching was best for learning different subjects of dentistry. 75% of the students stated that PPT was most effective for learning anatomy, orthodontics, 65.2% for physiotherapy, pathology, microbiology and oral medicine, 58% for dental materials and Prosthodontics, 69% for community dentistry, Endodontics and pedodontics, 74% for oral surgery and periodontics and was statistically significant ($P=0.000$).

45.8% of students opted for PPT as the best attention seeker followed by BB (36.4%) and 37.8% of students were motivated for PPT based lectures followed by BB (35.2%) ($P=0.000$). 40.4% of students stated that lectures were more interactive using BB followed by PPT (24.8%) ($P=0.000$).

40.4% of students revealed that lectures were more interactive using BB followed by PPT (24.8%) and was significant ($P=0.00$). Moreover students also stated that lectures were well organized (64.5%), clear and understandable (52.2%), stimulated interest in subject (53.8%), important points were stressed better (45.6%), well informative (68.2%), summarized the topic better (53.6%), recall tough points better (54%) and clinical aids were better demonstrated (77%) using PPT method and was significant ($P=0.000$). 70.6% of students showed interest in taking notes rather than taking handouts [29.4%].

The student feedback revealed that about 53.8% of the students were stimulated for further reading by PPT based lectures. The perception of diagrams (51.4%), flowcharts (56%) and notes taking (58.8%) was best accepted with PPT by all the students, which is in agreement with previous studies.^[4,9,10] In contrast to previous studies^[5,8,11,12] in our study student showed a preference for the use of PPT in dental education for all the dental subjects in agreement with previous studies done in different subjects^[2,4,10,13-18]. This study also showed that Biochemistry and pharmacology were better taught by BB as observed in previous studies^[2,6,19,20].

In BB based teaching, the students were active and were better able to cope with the teaching speed of the teacher as observed in the present study. It motivates an interest in learning and helps in holding attention in the class. OHP [5.4%] was the least preferred teaching aid for all parameters in this study. While using an OHP, it is easy to keep more information on one page

which makes the student memory working capacity overloaded [8, 20]. This may be the reason why students did not prefer the use of OHP during lectures.

In the present study, students were of the opinion that lectures were interactive with the use of Blackboard [40.4%] in agreement with the previous study [21]. In contrast to previous studies [2,21], the present study showed that stress on important points in lecture can be given better with the use of PPT.

This study also showed that students preferred to have lectures for short duration from teachers having good teaching skills utilizing AV aids. The questionnaire provided was found to be highly reliable ($\alpha=0.774$). The present study is advantageous with the selection of high sample size and the opinions were collected from all the batches of dental students including postgraduates regarding all the subjects and reliability of the questionnaire was also tested. Further, a multi-centric study involving both theoretical and practical case-based teaching for dental students will be beneficial to assess the best teaching aids in dental education.

Conclusion

Our study showed that lectures delivered using PPT were more appreciated by the students followed by BB and narration. OHP was the least preferred method by the dental students. We plan to implement feasible student suggestions for further improving the use of audiovisual aids during dental education.

Conflict of Interest

All authors declare no conflict of interest.

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