

# Research Article

## Addressing Problems of Oral Pathology Students after Improving Teaching Learning Methods

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### ABSTRACT:

**Background-** Oral Pathology and Oral Histology as academic subjects is concerning. Despite significant advancements through books, the internet, and conferences, gaps remain in students' understanding and interest in these fields. This may partly stem from the perception that these are non-clinical subjects with limited practical career opportunities. We thought of introducing latest teaching and learning methods to improve the students understanding and make it more interesting.

**Materials& Methods-** The cross-sectional questionnaire based study was done with BDS students, to gauge the understanding of their knowledge in the subject of Oral Pathology and Oral Histology after introduction of advanced teaching learning methods. There were 15 multiple choice questions. The data recorded was analyzed using frequency distribution.

**Results-** There were very positive results with new methods and it was evident in the understanding of the subject by the students.

**Conclusion-**Our study revealed that students generally have a good overall understanding of Oral Pathology. However, they do face certain challenges that can be easily addressed with appropriate measures. Through this research, we aim to raise awareness among readers about the evolving trends in teaching learning and encourage their regular incorporation into practice.

**KEY WORDS:** Game based learning, information technology, gamification, puzzles in teaching, competency based learning.

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### INTRODUCTION:

Dentistry is a 4 year under-graduate program (excluding internship). Oral Pathology is a basic subject that is taught in second and third year. This subject forms the basis of all the other subjects<sup>[1]</sup>. Continuous assessment is important and has been useful in teaching learning amongst dental students. This practice has been since decades<sup>[2]</sup>. Most of the dental institutes still rely on old teaching learning methods like lectures, practical, seminars, etc. With the advent of numerous online platforms, Artificial Intelligence (AI), gaming technologies, etc, teaching &

learning for oral pathology can be improved to make it more student centric<sup>[3]</sup>. On an average, 100 students are there in 1 professional year and each student has his/her own capacity to grasp and understand a subject. The foundation of dental students' education lies in their ability to recognize pathological diseases through microscopic examination<sup>[4]</sup>. This can be accomplished by studying books, dental literature, regularly viewing slides and adhering to the prescribed curriculum. The combination of theoretical understanding and practical skills is commonly referred to as knowledge. Rather

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**Table 1:** Questionnaire for BDS third year students after introduction of improved teaching learning methods.

<b>Demographic details:</b>					
Gender:	Male	Female			
Academic Session:	2021 -22	2022 -23			
<b>Questionnaire:</b>					
1.How many hours do you study oral pathology in a day? (including classes in institute)	(a)less than 1 hour	(b) 1 hour to 3 hours	(c) 3 hours to 5 hours	(d) more than 5 hours	
2. Do you attend lectures or read books which discuss slides before they are shown?	(a) Yes	(b) No			
3, Do you ask your teachers to explain, in case of difficulties?	(a) Yes	(b) No	(c) Sometimes		
4. Can online classes replace offline classes?	(a) Yes	(b) No			
5. Are you aware of the following? (Please tick 1 or more)	(a) Flipped classroom	(b) Gaming in teaching learning	(c) Competency based learning	(d) Collaborative learning	
6. Does the department use gamification for teaching learning?	(a) Yes	(b) No	(c) Sometimes		
7. Are smartboards used for teaching?	(a) Yes	(b) No	(c) Sometimes		
8. Which gamification platform is most beneficial? (Please tick 1 or more)	(a) Kahoot	(b) Crosswordlabs	(c) Puzzle. org	(d) Others	
9. If your answer to the above question is <b>Others</b> , please specify the platform					
10. Have you been guided to make videos of lesions?	(a) Yes	(b) No			
11. Do you refer to youtube channel for teaching learning?	(a) Yes	(b) No			
12. Have you used in mobile applications for teaching learning?	(a) Yes	(b) No			
13. Do you feel the difference in your performance after using games and Information Technology for teaching learning?	(a) Yes	(b) No	(c) Not sure		
14. Do you feel motivated?	(a) Yes	(b) No	(c) Sometimes		
15. According to you, gamification has helped to promote which of the following? (You may tick more than 1)	(a) concentration	(b) memory retention	(c) engagement	(d) team spirit	(e) progress tracking

than addressing it later, it is crucial to develop positive attitudes toward dental health promotion during one's time as a student<sup>[5]</sup>. Information technology (IT) has its use in almost all fields of education. Various online platforms, gaming applications have been explored for dental subjects<sup>[6]</sup>. We planned the curriculum of third year dental students with the introduction of AI, games, puzzles along with their lecture, practical and seminar. This attempt was made to reinforce our belief that IT can act as a catalyst and improve students performances.

### **MATERIALS & METHODS:**

A descriptive cross-sectional closed ended questionnaire based survey was conducted in the department of Oral & Maxillofacial Pathology of our institute. The study had the approval of the research advisory committee. The prepared questionnaire was distributed to all the undergraduate students after they completed their BDS 3<sup>rd</sup> year. We included the students of 2 academic sessions (Group-I & Group-II). The study's goals were explained to every participant. Each respondent received the questionnaire and was asked to complete it anonymously. A total of 196 students formed the study group. An informed consent was received from all the participants. The students were provided with the questionnaire containing multiple choice questions (MCQs) [Table 1]. It was structured to be straightforward and easy to understand and respond to. The design was pre-tested for accuracy, validity, consistency, and the clarity of the questions. The questions comprised of relevant alternatives. The identity of the participants was kept anonymous. The data recorded was analyzed using frequency distribution.

### **RESULTS:**

All the 196 participants responded to the questionnaire. There were 98 students in each academic session. In total, 36 were males and 160 were females, highlighting a predominance of females. Most of the students (63.77 %) study oral pathology as a course for 3 to 5 hours in a day. 67.34 % students confirmed that they read text before attending practical classes. Almost half the students ask their teachers to explain in case of difficulties. 79.08 % students were aware of gaming in teaching learning, while only 27.55 % knew about competency based learning. 59.18% participants

said that smartboards were used. Kahoot (89.2%) and crosswordlabs (90.30%) were most commonly used in teaching learning in the institute. 90.81% of students were guided to make videos for learning. 98.46% students confirmed that they use youtube channel and 94.38% admitted that they use some mobile application for learning. 86.22% responded that gamification and IT made positive difference in their learning. Around 93.87% students said that their progress tracking is the best outcome of these innovations. The results were not statistically significant. Table 2 describes the overall responses to the answers of the questionnaire.

### **DISCUSSION:**

The prospective study was an attempt to get firsthand knowledge from the students about their opinion on using IT, AI and various online platforms in teaching learning oral pathology. The participants believed that reading texts before classes helps them a lot. Moreover, around 70 % students sometimes or frequently ask the teachers to explain in case of difficulty and they confirmed that this arose interest in the subject. Similar finding was also seen in other studies<sup>[7]</sup>. Most of the students were aware of gamification in oral pathology. Almost 98.46 % students confirmed that although games and online platforms give leverage for good learning, offline classes are necessary. This has also been found in various other studies<sup>[8]</sup>. Competency based learning, flipped classroom and collaborative learning scored less compared to gamification. Around 89.28 % students accepted that knowledge assimilation and memory retention can be enhanced by platforms like Kahoot and crosswordlabs. Similar findings were also seen in other studies. We searched pubmed and could not find crosswordlabs use in oral pathology teaching<sup>[9,10,11]</sup>. The students refer to few youtube channels, such as Oral Pathology Ready Reckoner and mobile app for learning<sup>[6,12,13]</sup>. The use of online teaching may be an effective method of providing meaningful insights for undergraduate dental students<sup>[14]</sup>. There was a very strong and positive correlation between use of IT and dental education. Various attributes such as concentration, memory retention, engagement, team spirit and progress tracking are addressed by innovative teaching learning methods. To sum up, online platforms do have a positive impact on teaching and learning and influence modern learning.

### **CONCLUSION:**

Our study revealed that students generally have a good overall understanding of Oral Pathology. However, they do face certain challenges that can be easily addressed with appropriate measures.

**Table 2:** Overall responses to the Questionnaire

Questions	Answers	I N (%) out of 196	II N (%) out of 196	Total N (%) out of 196
1. How many hours do you study oral pathology in a day? (including classes in institute)	(a) less than 1 hour	10 (5.10 %)	09 (4.59 %)	19 (9.69 %)
	(b) 1 hour to 3 hours	15 (7.65 %)	17 (8.67 %)	32 (16.32 %)
	(c) 3 hours to 5 hours	64 (32.65 %)	61 (31.12 %)	125 (63.77 %)
	(d) more than 5 hours	09 (4.59 %)	11 (5.61 %)	20 (10.20 %)
2. Do you attend lectures or read books which discuss slides before they are shown?	(a) Yes	63 (32.14 %)	69 (35.10 %)	132 (67.34 %)
	(b) No	35 (17.85 %)	29 (14.79 %)	64 (32.65 %)
3. Do you ask your teachers to explain, in case of difficulties?	(a) Yes	46 (23.46 %)	52 (26.53 %)	98 (50 %)
	(b) No	32 (16.32 %)	28 (14.28 %)	60 (30.61 %)
	(c) Sometimes	20 (10.20 %)	18 (9.18 %)	38 (19.38 %)
4. Can online classes replace offline classes?	(a) Yes	02 (1.02 %)	01 (0.51 %)	03 (1.53 %)
	(b) No	96 (48.97 %)	97 (49.48 %)	193 (98.46 %)
5. Are you aware of the following? (Please tick 1 or more)	(a) Flipped classroom	32 (16.32 %)	40 (20.40 %)	72 (36.73 %)
	(b) Gaming in teaching learning	75 (38.26 %)	80 (40.81 %)	155 (79.08 %)
	(c) Competency based learning	24 (12.24 %)	30 (15.30 %)	54 (27.55 %)
	(d) Collaborative learning	30 (15.30 %)	40 (20.40 %)	70 (35.71 %)
6. Does the department use gamification for teaching learning?	(a) Yes	75 (38.26 %)	80 (40.81 %)	155 (79.081 %)
	(b) No	10 (5.10 %)	08 (4.08 %)	18 (9.18 %)
	(c) Sometimes	13 (6.63 %)	10 (5.10 %)	23 (11.73 %)
7. Are smartboards used for teaching?	(a) Yes	56 (28.57 %)	60 (30.61 %)	116 (59.18 %)
	(b) No	34 (17.34 %)	31 (15.81 %)	65 (33.16 %)
	(c) Sometimes	08 (4.08 %)	07 (3.57 %)	15 (7.65 %)
8. Which gamification platform is most beneficial? (Please tick 1 or more)	(a) Kahoot	85 (43.36 %)	90 (45.91 %)	175 (89.28 %)
	(b) Crosswordlabs	84 (42.85 %)	93 (47.44 %)	177 (90.30 %)
	(c) Puzzle. org	54 (27.55 %)	43 (21.93 %)	97 (49.48 %)
	(d) Others	05 (2.55 %)	07 (3.57 %)	12 (6.12 %)
9. If your answer to the above question is <b>Others</b> , please specify the platform				
10. Have you been guided to make videos of lesions?	(a) Yes	88 (44.89 %)	90 (45.91 %)	178 (90.81 %)
	(b) No	10 (5.10 %)	08 (4.08 %)	18 (9.18 %)
11. Do you refer to youtube channel for teaching learning?	(a) Yes	96 (48.97 %)	97 (49.48 %)	193 (98.46 %)
	(b) No	02 (1.02 %)	01 (0.51 %)	03 (1.53 %)
12. Have you used any mobile applications for teaching learning?	(a) Yes	90 (45.91 %)	95 (48.46 %)	185 (94.38 %)
	(b) No	08 (4.08 %)	03 (1.53 %)	11 (5.61 %)
13. Do you feel the difference in your performance after using games and Information Technology for teaching learning?	(a) Yes	84 (42.85 %)	85 (43.36 %)	169 (86.22 %)
	(b) No	03 (1.53 %)	02 (1.02 %)	05 (2.55 %)
	(c) Not sure	11 (5.61 %)	11 (5.61 %)	22 (11.22 %)
14. Do you feel motivated?	(a) Yes	90 (45.91 %)	94 (47.95 %)	184 (93.87 %)
	(b) No	01 (0.51 %)	00 (0 %)	01 (0.51 %)
	(c) Sometimes	07 (3.57 %)	04 (2.04 %)	11 (5.61 %)
15. According to you, gamification has helped to promote which of the following? (Please tick 1 or more)	(a) concentration	85 (43.36 %)	87 (44.38 %)	172 (87.75 %)
	(b) memory retention	75 (38.26 %)	80 (40.81 %)	155 (79.08 %)
	(c) engagement	80 (40.81 %)	85 (43.36 %)	165 (84.18 %)
	(d) team spirit	79 (40.30 %)	88 (44.89 %)	159 (81.12 %)
	(e) progress tracking	91 (46.42 %)	93 (47.44 %)	184 (93.87 %)

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**Conflicts of Interest**

There are no conflicts of interest.

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