



Use of crossword puzzle as a teaching aid to facilitate active learning in dental materials

KEYWORDS

crossword puzzle, dental materials, active learning

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ABSTRACT *Objectives: To use crossword puzzle as a teaching tool in dental materials and evaluate students' perception about the same.*

Methodology: A suitable topic was selected from dental materials syllabus and a crossword puzzle based on that topic was created using a free internet resource. The 2nd year dental students were given the crossword puzzles for solving. Group interactions for solving the crosswords were encouraged. Student perceptions of the crossword puzzle were analyzed using a pre-validated questionnaire.

Results: Majority of students felt that crossword puzzle facilitated better learning and understanding of the topic and they strongly favored incorporation of the same in the dental materials curriculum.

Conclusion: Use of crossword puzzle as a teaching tool in dental materials, can relieve the tedium of lecture and traditional teaching methods, providing a more relaxed and friendly classroom atmosphere. This will facilitate active learning and make the learning experience of the students more productive.

Introduction

The primary mode of curriculum delivery in dental materials had traditionally been in the form of didactic lectures, where the teacher had the central role and students were passive listeners. In the present day scenario, more emphasis is being laid on creating learning environment which are student centred and facilitate active learning (Michael, 2006)⁴. Incorporation of active-learning methods into classroom allows lecturers to engage students in the learning process and make their learning experience more effective, efficient and meaningful (Graffam, 2007)³. Active learning promotes acquisition of generic skills and attitudes such as communication skills, cooperative learning, critical thinking and self-directed learning.

Researchers have advocated use of games and puzzles in the classroom as active learning formats. Students especially have been found to prefer games and other alternative teaching methods over the traditional methods (Moore & Dettlaff, 2005)⁵.

Crossword puzzles have been shown to be effective teaching tools of terminology, definitions, spelling, and pairing key concepts with related names, resulting in greater retention and memorization of facts (Franklin, Peat and Lewis, 2003)². However, use of crossword puzzles as a teaching tool to facilitate active learning in dental materials has not been explored.

Majority of the dental students often find it difficult to remember and recall the various dental materials, their properties and applications. Providing these students with crossword puzzles pertaining to dental materials, will stimulate their minds, help them in identifying areas of understanding as well as lack of comprehension and promote active learning.

Objectives

The objective of the study was to evaluate the perceptions of dental students regarding crossword puzzle as a teaching tool to enhance active learning in dental materials.

Methods

The study was conducted on 2nd year dental students. Total sample size was 70. Topic to be included in the crossword puzzle was decided after discussion with the dental materials faculty and students. Based upon their suggestions, a particular topic, which had already been taught in class but was regarded by the students as difficult to understand and remember, was selected. A crossword puzzle was designed using free online resource and was validated by two experts from the department of dental materials.

Printed copies of the crossword puzzle were given to the students to solve. Group discussions were encouraged while solving the puzzle to promote collaborative learning. Time given for solving the crossword was 20 minutes. At the end of the allotted time, correct answers to the crossword puzzle were discussed.

A pre-validated questionnaire consisting of 8 items was used to record students' perceptions about crossword puzzle as a tool to enhance active learning in dental materials. All 8 items were close-ended questions and the responses were recorded on a 5-point Likert Scale (1 = strongly disagree to 5 = strongly agree). Students' responses to the items 1-8 were expressed as percentages.

Results

93% of the students strongly agreed that solving crossword puzzle was fun experience and they enjoyed learning through recreation (Table-1). 82% of the students strongly felt that their understanding of the topic was improved as a result of the crossword activity. 54% of students felt that the crossword puzzle activity was challenging and problem solving. 52% of students were of the opinion that the core area of the topic was emphasized by the crossword puzzle clues. 70% of students strongly felt that the crossword promoted active learning and 64% felt that it helped them to remember important terms from the topic. Incorporation of crossword puzzles in dental materials curriculum was strongly favoured by 80% of students.

Table1: Student Perceptions of Crossword Puzzle as Teaching Tool (Total N=70)

S.no.	Statements	Percentage %				
		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	Fun experience to solve crossword puzzle	0	0	0	7	93
2	Improved my understanding of the topic	0	0	3	22	75
3	Challenging and problem solving	0	0	10	36	54
4	Emphasized core area of topic	0	0	2	46	52
5	Helped to remember important terms from the topic	0	0	0	36	64
6	Enjoyed learning through recreation	0	0	1	6	93
7	Promoted active learning	0	0	18	12	70
8	Incorporation in dental materials curriculum to encourage active learning	0	0	8	12	80

Discussion

Dental materials has often been regarded by the students as a difficult and volatile subject that requires them to memorize and retain a lot of information pertaining to various materials used in dentistry. It is often difficult for the students to recall and reproduce the information during the written or oral examinations.

Incorporation of active learning strategies, such as crossword puzzles, in dental materials may overcome these problems. Stewart, Brown, Clavier and Wyatt (2011)⁹ emphasized the positive role active learning plays in enhancing students' learning. Saxena, Nesbitt, Pahwa and Mills(2009)⁷ found that incorporation of active learning strategies into the curriculum can improve understanding and learning.

In this study we analyzed students' perception of crossword puzzle as an educational tool to facilitate active learning and provide a positive learning experience. Majority of students felt that crossword puzzle improved their understanding of the topic, helped them to remember important terms and promoted active learning. These findings are consistent with the results of the study done by Ritzko and Robinson (2006)⁶.

The crossword puzzle activity was a pleasurable experience for the students and they enjoyed the interactive learning through recreation. Crossword puzzle provided the students with a much needed break from the monotonous lectures, making them more enjoyable and interesting than traditional teaching techniques. Childers (1996)¹ and Shah, Lynch, and Macias-Moriarity (2010)⁸ had reported similar results in their study, where the use of crossword puzzle had been considered as enjoyable and helpful by the students.

The crossword puzzle activity was perceived to be challenging and problem solving by most of the students. In order to solve the crossword puzzle, the students needed to read through the clues, recall what had been taught previously in the class and to interact with other students. This helped to create an environment for active learning, leading to a better comprehension and retention of the learning material and also contributed towards the positive learning experience perceived by the students. Research has shown that crossword puzzles do have a positive effect on learning (Weisskirch, 2006)¹⁰. These puzzles also help to motivate the students and increase their interest in the topic at hand (Franklin et al., 2003)². Crossword puzzles make studying more enjoyable and have been advocated by researchers to be used as a supplement to traditional methods, not as a replacement (Moore & Dettlaff, 2005)⁵.

Conclusion

Use of crossword puzzle as a teaching tool in dental materials, can relieve the tedium of lecture and traditional teaching methods, thereby providing a more relaxed and friendly classroom atmosphere. This will facilitate active learning and make the learning experience of students more productive.

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