



Debate as an Adjunct Tool in Teaching Undergraduate Dental Students

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Abstract

This work is an attempt to explore the potential of a new educational method that integrates debate as a teaching tool. This new teaching method was implemented into a single academic semester of an undergraduate bachelor of dentistry program. We sought to combine knowledge delivery with high-level debate between student debaters, and with the active participation of the audience who were themselves students. The teaching method comprised of three elements namely debates, reply speeches, and policy papers. Debating followed the World School Debate Championship (WSDC) format. Debate evaluation involved five main categories; argument, rebuttal, style, definition and strategy, and points of information (POIs). Student perception towards this educational method was evaluated using a Likert-scale questionnaire. Students gained valuable knowledge from the experience as reflected by the favorable Likert outcome scores. This work sheds light on the potential advantages of utilizing debate as a teaching tool from a student's perspective. Implementing debate in teaching improved students' ability to search and appraise scientific papers and proved to be meaningful and enjoyable. The carefully tailored 10-week format ensured good student responsiveness and engaged the entire class in an interactive, participatory setup. This educational method proved to be very effective in evidence-based dentistry teaching by promoting a deeper approach to learning that can help students to learn meaningfully and enhance their critical thinking skills.

Keywords Dental education · Teaching methods · Student-directed learning

Introduction

Dental education for undergraduates does not typically rely on controversy to deliver meaningful knowledge. Dental educators endeavor to deliver simplified theories and straight-to-the-point facts and not to confuse students at sophomore and junior levels with controversial issues. However, senior students, including interns, usually feel betrayed when the basics they acquired at one level of their training program are contradicted at another.

Students do not want uncertainty in their education, and eventually they will follow one school of thought. However, their choice can be easily biased-without-basis. Every attempt should be made to enhance students' ability to search the dental literature effectively in order to find answers to real-

world questions [1]. Here comes the need for an educational experience that allows students to observe controversial issues being addressed openly, scientifically, and integrated directly within dental practice. Debating was found to be highly rated by student learners [2–5]. However, it has not been widely studied in medical and dental education [6].

This work is an attempt to explore the potential of a new educational method used at Jordan University of Science and Technology. This method integrates debate as a teaching tool that was implemented into a single academic semester of an undergraduate bachelor of dentistry program. We sought to combine knowledge delivery with high-level debate between student debaters, and with the active participation of the audience who were themselves students.

Methodology

This educational method was introduced as an adjunct tool in the Conservative Dentistry course for fourth-year dental students. The class was comprised of 281 fourth-year dental students. Students were divided into 10 groups. Six of these

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groups were assigned to debate, and the remaining four were assigned to present the reply speeches (Fig. 1). All groups were asked to construct policy papers. The allocation process of debating teams, reply speeches, and policy paper subjects was random. Each group had two team leaders: one responsible for debate/reply speeches; and the other responsible for policy papers. Team leaders’ duties consisted of conducting group meetings, assigning work to each group member, and communicating with the course coordinator and debate trainers.

An advisory committee consisting of four members (the course coordinator and three debate trainers) was responsible for providing feedback and continuous support to students throughout the process of preparation and rehearsing mock debates. Debate adjudication and policy paper evaluation were assigned to a different committee (the course coordinator and two teaching faculty members).

Teaching Method Format

The new educational method that was used is comprised of three elements namely debates, reply speeches, and policy papers.

1. Debates

The debate format used in the methodology was based on the World School Debate Championship (WSDC) format [7]; in each debate, two teams were standing on opposite sides of the motion. The proposition team supported the house beliefs stated in the motion, while the opposition team stood against the motion (a motion is a sentence that represents the controversial issues to be addressed in the debate) (Table 1). Each team was composed of three speakers with 5 min to deliver their speech.

The evaluation form involved five main categories as follows:

Definition and strategy: The ability of debaters to define the terms of the motion and build their team’s strategy. This requires the first speaker to state a crystal-clear definition of the motion and clearly identify the roles for each speaker.

Argument: The ability of debaters to construct an argument, provide evidence, structure the scientific explanation that will underline the argument, support the explanation with literature-based evidence, and finally recap the argument and give some concluding remarks that relate to the strategy adopted by their team.

Rebuttal: The ability of debaters to rebut their opponents’ arguments, compromise their evidence, and point out the clash points between the two teams.

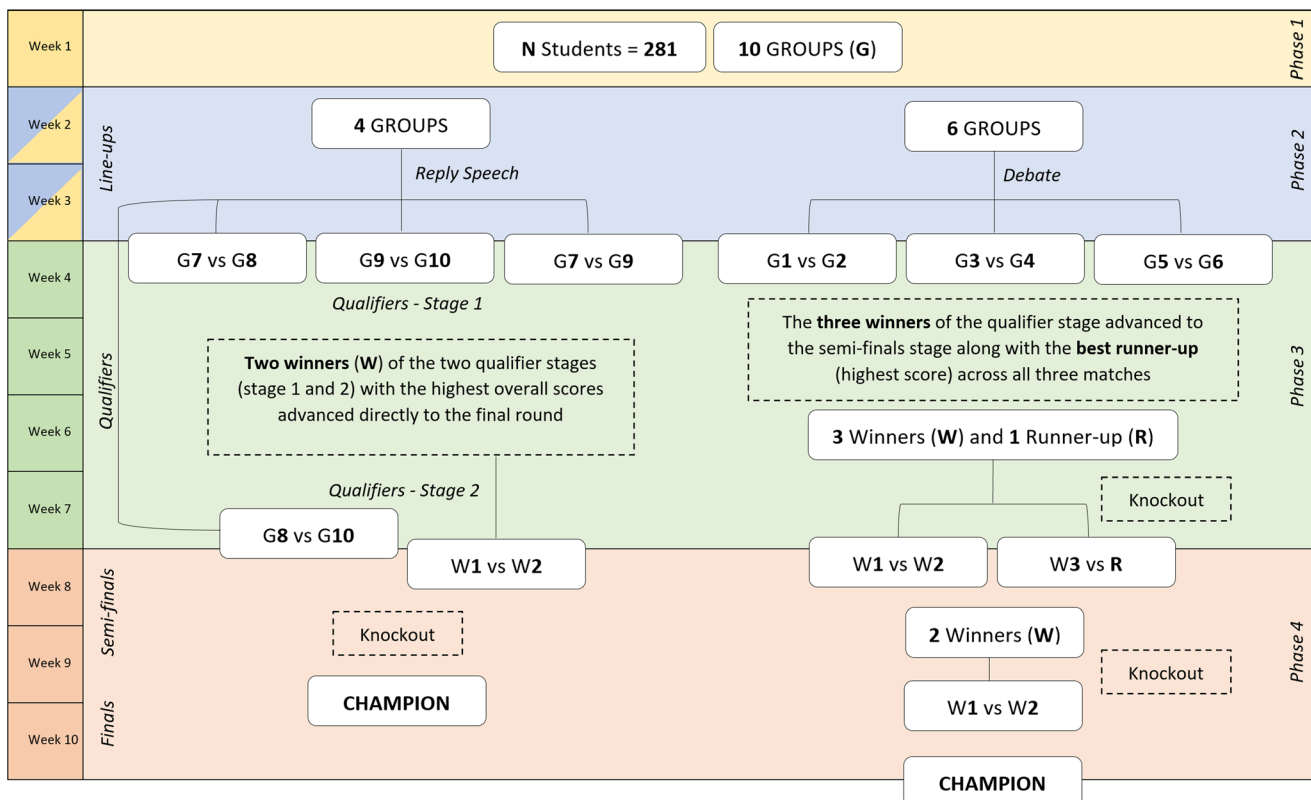


Fig. 1 A flow chart illustrating methodology phases

Table 1 House motions

Qualifier stage	Round		
Qualifier stage	1	1	“This house believes that clinicians should aim to preserve the canals rather than performing aggressive preparation to achieve ‘cleaner’ canals.”
	2	2	“This house believes that the ‘Initial binding file’ technique to determine the canal width should be replaced with Weine’s three-sizes rule.”
	3	3	“This house believes that clinical endodontic education & practice in dental schools in Jordan should be entirely rotary-oriented, instead of the current hand filing techniques.”
Semifinal stage	1	1	“This house believes that any carious lesion at any stage of its progression can be arrested.”
	2	2	“This house supports using the approach of selective caries removal to soft dentine in deeply cavitated lesions.”
Final stage			“This house believes that dentists should only conduct interventions that are feasible for the patient.”

Style: The ability to present a speech within a limited time frame style, and use appropriate language, style, tone, and rhetoric.

Points of information (POIs): Debaters were encouraged to interact with their opponents’ speeches through the so-called points of information. These are brief interruptions offering a question or a statement addressed to the speaker. Speakers had the right to accept or decline a POI, and they were evaluated according to their ability to utilize the POI in supporting their stand.

2. Reply Speeches

Reply speeches followed a modified WSDC format where the non-debating groups (4 groups) are requested to formulate and present a 3-min summary that highlights the clash points between proposition and opposition and showcase the merits of one’s own team and weaknesses of the other team (the remaining six groups were assigned to debate). Reply speakers were instructed to start with the following sentence: “Our team is a winner because...”. Each debate had two reply speeches, starting with that of the opposition, and ending with that of the proposition. The reply speeches took place 15 min after the final speech of each debate match except the final round where the reply speech is omitted.

3. Policy Papers

In addition to the adopted modified WSDC format, this work implemented a new approach of adding policy papers into this educational method. Policy papers were written assignments related to each of the topics covered in the debates.

The following phases demonstrate the complete process of the methodology:

Phase 1. Demonstration

This phase revolved around introducing the concept of debates and policy papers to students. The format that will be used in the methodology, the scoring system, the relevance of

debates with the course, and the objectives they are expected to fulfill were highlighted using the following methods:

- Two 1-h interactive sessions. The second session involved a mock debate.
- A “Student Guide” into debating and policy paper construction.
- An interactive online platform.

The total devoted hours for this phase was 10 h (outline preparation, online platform design, and interactive sessions).

Phase 2. Initial Research and Drafts Construction

The motions for the qualifiers were announced to the students. At this stage, no group was assigned to a certain topic, students were requested to research and prepare all qualifier and semifinal stage topics. A duration of 2 weeks was given to get the feedback on the initial research drafts from the advisory committee.

The total devoted hours for this phase was 12 h (preparation of motion topics by the course instructor and evaluation and feedback by the advisory committee).

Phase 3. Preparations for the Qualifiers of Debates and Reply Speeches and Policy Papers.

At this phase, groups were assigned to a specific topic for the debates, reply speeches, and policy papers. Topics were assigned so as to ensure that no group would construct a policy paper with a topic that is similar to the topic of their debate or reply speech. The sides adopted by the debating teams and reply speakers were determined 30 min prior to the debate. The qualifiers included three debates, which took place on three consecutive weeks. As for policy papers, student groups were requested to construct a paper that either supports or stands against one of the qualifier motions, namely (1) clinicians should aim to preserve the canals rather than performing aggressive preparation to achieve ‘cleaner’ canals, (2) ‘initial binding file’ technique to determine the canal width should be

replaced with Weine's three-sizes rule, and (3) clinical endodontic education & practice in dental schools should be entirely rotary-oriented, instead of the current hand filing techniques (Table 1).

The total devoted hours for this phase was 12 h (evaluation, score calculation, and decision making by the debate adjudication committee and face-to-face feedback by the advisory committee).

Phase 4. Final Rounds and Policy Paper Submission:

Semifinals and finals: Following the three qualifier rounds, debate and reply speech scores were calculated out of 300 and 100 consecutively. The four debating groups with the highest score out of 300 were selected to debate in the semifinal stage, and the two reply speech groups with highest score out of 100 qualified to the next round (Fig. 1). Semifinal stage rounds were similar to the previous rounds, except that each group was assigned to a specific side upon announcing the motions. However, for the final debate, 1 h was given for the team to prepare due to the fact that the motion was not announced beforehand as in the previous rounds. Finally, a live voting session was used to determine the winner of the championship but was not taken into consideration for the final course evaluation score. By the end of this phase, each group was requested to submit their policy paper for evaluation.

The total devoted hours for this phase was 18 h (evaluation, score calculation, and decision making by the debate adjudication committee).

Evaluation Criteria

The overall evaluation score (final grade) was based on a two-part assessment procedure. Grades were marked by three departmental staff members that reflected each group's ability to (1) debate or present a reply speech, and (2) construct a policy paper.

Debate/Reply Speech

Debate

An evaluation sheet was used to provide a structure for the evaluation of debate matches. The evaluation sheet consisted of five categories as follows:

Definition and Strategy Debaters were given a score out of 15 points based on their ability to implement a well-structured strategy and a clear definition. This also measured the team's ability to adequately define motion terms while explicitly referring to evidence-based literature. However, the first speaker from the proposition side was given a score out of 40 points.

Argument Debaters were given a score out of 30 points based on their ability to construct an argument of four elements (statement, explanation, evidence, and recap). Only arguments that were derived from the strategy adopted by the debating team were considered.

Rebuttal Rebuttals were scored out of 25 points, measuring the ability of the debater to listen, analyze, and refute the opponent's argument. Only rebuttals that were clearly directed towards the strategy and arguments adopted by the opponent team were considered. However, the first speaker from the proposition side did not receive a score for this criterion.

Style Speakers' style (20 points) was assessed in terms of six aspects: audience engagement (i.e., judges), time management, language, style, tone, and rhetoric. Statements made after the time limit were not considered. It is worth mentioning that the timekeeper notified the speaker (by ringing a bell twice) when time had expired.

POIs This measured the debating team's ability to deliver (5 points) and/or receive (5 points) a POI and utilize it in supporting their stand and defend against and/or attack the other team's points. POI scores were marked in an "all-or-none" fashion with a possible maximum score of 10 points.

Reply Speech

An evaluation sheet was used to provide a structure for the evaluation of reply speeches. The evaluation sheet consisted of three categories as follows:

Summarization of Arguments Reply speech presenters were given a score out of 45 points based on their ability to fully summarize their team's arguments in an organized, efficient manner that highlights their team's points of strength.

Summarization of Rebuttals Reply speech presenters were given a score out of 35 points based on their ability to point out all clash points encountered during the debating match and summarize all the rebuttals in an organized, efficient manner.

Style Speakers' style (20 points) was assessed according to the same criteria as described for the debating groups.

Policy Papers

Policy papers were evaluated based on two main elements:

1. The scientific content of the paper (70 points): the content must be sound, policy relevant, evidence-based, presented in reasonable detail, and reflects the student's understanding of the work.

2. Structure, organization, and style of the paper (30 points): all elements of structure must be present (e.g., abstract, introduction, body, conclusions, bibliography) along with an appropriate organization and style.

Teaching Method Assessment

This educational method was evaluated by student perceptions using a questionnaire. Students were asked to rank questions statements using a Likert scale (five responses ranging from “strongly agree” through “undecided” to “strongly disagree”). The questionnaire was distributed after the qualifier stage and included questions to elicit students’ satisfaction of the educational method in terms of the following aspects:

1. Students’ course perception
2. Ability to present meaningful knowledge
3. Ability to search and appraise scientific papers
4. Satisfaction with the pre-debate preparations
5. Students’ debate set-up and format perception

The questionnaires were collected anonymously, and data were analyzed by Microsoft Excel version 16 using descriptive statistics. After the final round, two discussion sessions were employed, one with the team leaders and one with the departmental faculty members in deciding whether to implement this educational method in the future.

Results

A total of 250 students responded to the questionnaire (89% response rate). The questionnaire results showed the following [mean (range), SD]:

1. Overall satisfaction with the new instructional method [4.4 (1.0–5.0), 1.0]
2. Improvement of the ability to present meaningful knowledge [4.6 (1.0–5.0), 1.0]
3. Increased confidence with their ability to search and appraise scientific papers [4.5 (1.0–5.0), 1.0]
4. Satisfaction with the allocated time for the pre-debate preparations [4.6 (1.0–5.0), 0.9]
5. Enjoyable and satisfactory debate set-up and format [4.4 (1.0–5.0), 1.0]

Overall, 14 departmental faculty members (out of 14) and 19 team leaders (out of 20) attended the discussion sessions.

The analysis of the discussion sessions showed that most team leaders and departmental faculty members (68% and 86% respectively) found this educational method beneficial

and can be considered as an effective teaching tool in the future.

However, 2 departmental faculty members expressed their concerns about the required level of experience needed for a successful debate. Moreover, 6 team leaders were mostly concerned that this educational method would take up too much time of their schedule, since the undergraduate dentistry curriculum is rather overloaded.

Discussion

Implementing debate as an adjunct teaching tool assists the dental student in gaining meaningful knowledge and stay up-to-date with the latest published evidence. Complex theories can be translated into easy-to-understand pieces of information to help future clinicians highlight relevant variables that can be reflected as therapeutic interventions which in turn will bridge the gap between basic theory and clinical practice [8].

Students will find themselves on the path to a wealth of new literature that is both entertaining and stimulating. Debate motions were specifically developed to integrate current and emerging topics in conservative dentistry which, in turn, ensured the fluidity of discussions while maintaining balanced clash points throughout. Learning evidence-based dentistry through social discussion and experiencing the process of resolving or at least working towards understanding a problem will collectively contribute towards fulfilling the principle of self-learning [9, 10].

The motions were selected to establish a pattern that would lead the students to develop a variety of skills. Subjects covered aimed to guide the students towards utilizing theoretical knowledge into their clinical practice and were tailored to orient the students towards the most suitable decision to make in the case of ethical dilemmas. Moreover, all groups were requested to submit their policy papers which thoroughly discussed motion topics (Table 1) provided that each group had to review a topic that differs from the one they prepared for the debate match. The importance of this is reinforced by the fact that exposing students to as many core topics as possible improves their ability to search, find, and comprehend meaningful knowledge [11].

Implementing this innovative teaching method aimed to provide the students with the knowledge needed to make evidence-based clinical decisions, allow them to develop scientific appraisal and research skills, and guide them towards formulating new clinical regimens during clinical setting. Qualifier debates were key factors in the process of building an evidence-based knowledge and clinical decisions while the policy papers provided space for the students to improvise and validate clinical solutions through better understanding of literature and scientific concepts.

Pre-debate preparations allowed students to think through the arguments and organize their thoughts on debate motions, a process that may be useful to students when confronted by colleagues in their community whose ideas and principles with regard to patient care differ from their own. Much of the success of this teaching method is to be attributed to the meticulous pre-debate preparations.

The debating teams and those of the reply speeches were requested to prepare two opposite views of the same topic. Debaters and reply speakers learn on which side of the debate they stand (i.e., opposition versus proposition) approximately 15 min prior to the debate. This encourages students to formulate strong definitions, strategies, arguments, and rebuttals as well as explore through all the evidence not only from their perspective but also from the perspective of the other team. Encouraging debaters to showcase contrary opinions leads to healthier discussion that raises the bar and increases engagement of all students. This is underpinned by the principle of interpersonal cognitive conflict in improving task performance [12]. Task performance was further enhanced by orienting students towards team working and group decision making so as to utilize the allocated time slot of 15 min effectively.

The guidelines of the WSDC format state that the reply speeches should be given by a member of the proposition and another member of the opposition teams, but our aim was to overcome the large number of students, which led to the implementation of reply speeches that allowed non-debating groups to be an active part of the debating process, and to evaluate their ability to listen, summarize, and point out clash points. This reflects the flexibility of the WSDC guidelines that can be safely amended to fit the intended purpose, unlike the rigid British Parliament format in debating [2].

The debate format sought to create a competitive atmosphere to gain and uphold students' interest throughout the 10-week course. Moreover, establishing a methodology that had 10% impact of a 7-credit-h course focused and directed students' attention throughout the course and increased their dedication towards the debates and policy papers.

To our knowledge, this is the first teaching tool format to have a three-dimensional core that consisted of implementing the skills of debate, reply speech, and policy paper preparation in a single format in dental education. This has an edge over previous approaches mainly because doing so opens up the opportunity to participate to all students.

When looking at possible limitations of this study, we acknowledge that more questions could have been included within our questionnaire as to provide more details of the students' perception of gains from participating in the debating exercise, we settled on five for the purposes of this paper. The goal was to keep it short and simple to increase the likelihood of participation.

Comments throughout the group discussions revealed that there are two main factors governing the success of utilizing this teaching method, namely debate expertise and time commitment. The course instructor must possess some experience in debating or prior knowledge of its utility on a classroom scale. In addition, the demanding time commitment meant that only keen and motivated team leaders would successfully fulfill their role appropriately. It is not clear whether this debate-centered teaching methodology can be widely adopted given the overall time commitment. However, it will certainly be of great use to tutors trying to initiate learning of this kind.

Further implementations for this teaching method are required (and planned to be undertaken in the future); however, such methods must be meticulously designed and thoroughly thought through to ease the task of verifying that all learning objectives are met and, in general, to increase the chances for success both technically and educationally.

Conclusion

Students gained valuable knowledge from the experience as reflected by the favorable Likert outcome scores. This work sheds light on the potential advantages of utilizing debate as a teaching tool from a student's perspective. Implementing debate in teaching improved students' ability to search and appraise scientific papers and proved to be meaningful and enjoyable. The carefully tailored 10-week format ensured good student responsiveness and engaged the entire class in participatory learning. This educational method, we believe, is the new paradigm in evidence-based dentistry teaching and will take the dental graduates into the next level.

Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

Ethical Approval NA

Informed Consent NA

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References

1. Kennedy R. In-class debates: fertile ground for active learning and the cultivation of critical thinking and oral communication skills. *Int J Teach Learn Higher Educ.* 2007;19:183–90.
2. Khan SA, Omar H, Babar MG, Toh CG. Utilization of debate as an educational tool to learn health economics for dental students in Malaysia. *J Dent Educ.* 2012;76:1675–83.

3. Ong CC, Narasimhan KL. A novel learning experience: case-based, evidence-based debate. *Med Educ*. 2010;44:515–6.
4. Nguyen VQ, Hirsch MA. Use of a policy debate to teach residents about health care reform. *J Grad Med Educ*. 2011;3:376–8.
5. Mamtani M, Scott KR, DeRoos FJ, Conlon LW. Assessing EM patient safety and quality improvement milestones using a novel debate format. *West J Emerg Med*. 2015;16:943–6.
6. Keynejad RC, Creed S, Fernando M, Bell D, Codling D, Crowther G, et al. Docbate: a national medical student debate. *Acad Psychiatry*. 2017;41:839–41.
7. Quinn S. *Debating in the world schools style: a guide*. IDEA; 2009.
8. Barnard PJ. Bridging between basic theory and clinical practice. *Behav Res Ther*. 2004;42:977–1000.
9. Lowry N, Johnson DW. Effects of controversy on epistemic curiosity, achievement, and attitudes. *J Soc Psychol*. 1981;115:31–43.
10. Moore KG, Clements J, Sease J, Anderson Z. The utility of clinical controversy debates in an ambulatory care elective. *Curr Pharma Teach Learn*. 2015;7:239–48.
11. Garvey MT, O’Sullivan M, Blake M. Multidisciplinary case-based learning for undergraduate students. *Eur J Dent Educ*. 2000;4:165–8.
12. Cosier RA, Rose GL. Cognitive conflict and goal conflict effects on task performance. *Organ Behav Hum Perform*. 1977;19:378–91.