

Formal Debate: An Active Learning Strategy

Frank A. Scannapieco, D.M.D., Ph.D.

Dr. Scannapieco is Associate Professor, Department of Oral Biology, School of Dental Medicine, State University of New York at Buffalo. Direct correspondence and requests for reprints to him at Department of Oral Biology, School of Dental Medicine, 318 Foster Hall, State University of New York at Buffalo, Buffalo, NY 14214. e-mail: Frank_Scannapieco@sdm.buffalo.edu

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A movement has occurred in higher education over the last several decades promoting methods of active learning.¹ Active learning is defined as those methods that encourage students to become involved in higher order thinking tasks such as analysis, synthesis, and evaluation. Thus, active learning differs from passive learning (such as the typical lecture) in that active learning fosters complex thinking processes and improves retention, assimilation, understanding, and proper application of course content. This movement toward active learning has not spared schools of dental medicine. Indeed, the latest "Accreditation Standards for Dental Education Programs" stipulate that graduates of dental schools "must be competent in the use of critical thinking and problem-solving related to the comprehensive care of patients."² The recent Institute of Medicine report on the future of dental education has formally recommended educators to "shift more curriculum hours from lectures to guided seminars and other active learning strategies that develop critical thinking and problem solving skills."³

Methods of active learning take diverse forms.⁴ One interesting active learning technique is the formal debate. Debate is an ancient endeavor, having long provided training in communication from its roots in ancient Greece and Rome. It appears that

modern intercollegiate debate had its beginning in the United States on November 29, 1872, when students of Northwestern University debated students from the University of Chicago.⁵ Subsequently, formal debate became very popular, with many high schools and colleges sponsoring debate teams.

As an educational process, formal debate is a competitive, enjoyable intellectual activity whose main purpose is to communicate ideas.⁶ Debate is an effective means by which opposing theories or alternative solutions to complex problems can be articulated. Debates can provide many benefits to students, including reduction of instructor and/or student bias, enhancement of library research skills, stimulation of critical and logical thinking, advancement of public speaking and communication skills, and motivation of student learning.^{7,8} There is also evidence to suggest that debate improves the quality of both thinking and writing skills.⁹ Formal debate can motivate students to learn, to appreciate the need to provide supporting evidence for their beliefs, and to expect the same of others. Debate also illustrates how issues pertinent to an applied science such as dentistry are often not clearly defined, unlike what is often presented in textbooks. Indeed, exceptions and alternatives exist for most, if not every, "rule" of dental practice.

Learning from debates does not appear to be limited to those students directly involved; those in the audience also appear to learn considerably from observing a debate.¹⁰ Furthermore, students seem to enjoy this activity and recognize its value.²¹ It is therefore curious that, in spite of numerous recognized merits, debate has seldom been incorporated into dental curricula.

The intention of this article is to present a model for formal debate in the dental school classroom and to provide insight into its application with dental students. For more complete descriptions of the processes of formal debate, the reader is referred to any of the many insightful books and articles written on this subject.^{5-8,12-15}

Organizing a Formal Debate

The ultimate goal of debate is to convince the listener of the correctness of a position or argument. Listed below are several essential characteristics of good debate:¹³

1. Each debater must understand the question and have knowledge of all of the important facts concerning it. The debater must know all sides of a subject to advocate one side of an issue in an intelligent manner.
2. The strategy for the debate must be carefully planned to present an integrated, unified constructive case.
3. Both constructive speeches and rebuttals must be well-organized so that each point stands out clearly.
4. Every point must be supported by sufficient evidence.
5. Every constructive point made must be considered in rebuttal. Thus, the constructive contentions must be summarized by the rebuttal and then attacked.
6. The ideas must be expressed in clear, effective language. The ideas should be presented using informal, conversational style, but in a way to make the ideas presented compelling.

A model derived from examples in various sources^{6,8,12,13} can be utilized to guide students in their preparation for and conduct of the debate. This debate format (Table 1) was devised to provide precise instructions to students, using reasonable time limits. All team members are required to participate in the debate by presenting a constructive speech, answering a question, or presenting a rebuttal. The rules, topics to be debated, time limits, and judging criteria can be modified to fit specific course constraints.

Debate is best accomplished by pairing two evenly matched teams against each other. Ideally, these teams are formed at the beginning of the course and work together for a reasonable period of time to prepare for the debate. At our institution, a formal debate experience has been incorporated into a course that uses the "Team Learning" model.¹⁶ Team learning is a cooperative educational method that encourages student collaboration and cooperation through sharing of respective experiences and knowledge background as the course material is mastered.¹⁷ Features of Team Learning include: the assignment of students to permanent heterogeneous groups; grading based on a combination of individual and group performance and peer evaluation; the use of the majority of class time in small group application-oriented tasks that encourage active participation; and the use of a fixed instructional activity sequence. Approximately five to six hours of class time are devoted to the debate activity. Thus the debate is a semester-long group activity required for successful completion of the course.

At the start of the course each team is given the opportunity to indicate its debate topic preference. Students are warned that the affirmative team will be chosen by the course director on the day of the debate; thus both teams must be prepared to argue for and against the resolution.

The topics selected for debate must be chosen with care. Each topic is portrayed as a resolution or statement (for example, "Dental water lines are a risk to the health of dental patients"). Good debate topics are those that provide sufficient ambiguity or controversy so as to be debatable. Certainly, the dental sciences provide a wealth of debatable topics. Debate topics that may be appropriate for courses in preventive dentistry or oral biology are provided in Table 2.

The formal debate begins with the constructive speeches developing the arguments that support or refute the resolution. The affirmative team gives the first constructive speech, and the constructive speeches alternate between affirmative, negative, affirmative, etc. Students are encouraged to provide concise, cogent arguments based on scientific evidence. Typically, data (in the form of graphs, figures, or tables) are presented in support of each argument.

The purpose of questioning during the debate is to clarify issues presented in the constructive speeches and to gauge the depth of knowledge of each team. Questions may come from a variety of sources: faculty, judges, or fellow students. The questioner may ask any fair, clear question that has a direct bearing

on the debate. Teams are encouraged to confer within the group before answering within the allotted time. The answering participant must give as short and clear an answer as the question warrants. Justification for the answer must be explained; simple yes/no answers are not acceptable.

Rebuttal speeches are made following the questioning period. The rebuttal summarizes the team's position and attacks the validity of the contention put forth by the opposing side's constructive speeches, or supporting one's own constructive contention after it is attacked by the opposing team. The rebuttal period is a time to point out the weakness in the opposing team's arguments and to summarize team positions. Typically, new issues are not presented in a rebuttal speech.

The management of non-debating students is of great importance to the success of the debate as a learning experience for the class as a whole. Several strategies can be applied to engage non-debating students. First, attendance may be taken to encourage students to observe each debate. Second, each student might be asked to submit one or more multiple choice questions (and their choice of correct answer) for each debate. Questions so submitted might be used to construct an examination to be given to the entire class. To help students to prepare for this post-debate examination, each debate team might prepare a one to two page summary of the controversial issue explaining both pro and con positions along with a list of the articles the team used to prepare for the debate. These summaries can be distributed to all students for study, although it may be necessary for the instructor to evaluate the quality of these summaries prior to their distribution to the rest of the class.

Lessons Learned

The "Rules of Debate" shown in Table 1 have for several years guided second-year dental students at the University at Buffalo to prepare for debates held in a course entitled "The Biological Basis for Preventive Dentistry." This course provides in-depth consideration of the biological basis for normal oral function (e.g., dental plaque formation, salivary physiology), the pathogenesis of the common oral diseases (dental caries, periodontitis, oral cancer), and the means by which these diseases can be prevented. As the course is taught using the Team Learning method,^{16,17} the class is already divided into permanent, heterogeneous groups or teams. Previous

reports have recommended optimal learning group size to be four to six individuals,¹⁸ which our experience corroborates. At the start of the course each team is allowed to rank order three controversial topics they are most interested in debating from a list of eight to ten topics.

As originally practiced, the position of the teams was chosen by coin-toss, with the winning team choosing the side they wished to argue for. However, it was observed that most groups colluded to determine in advance the teams that would argue on the affirmative and negative sides. This behavior may be, in part, a manifestation of coping strategies used by students to manage the intense dental curriculum. Whatever the reason, such behavior may undermine the learning experience afforded by the formal debate. Thus, while it is assumed that to cogently argue for or against a resolution one must have thorough knowledge of the subject, it may necessary to insist that each team prepare to argue both sides of the issue in order to maximize student learning. Similarly, when students were given responsibility to ask questions of the opposing team, it was observed that students appeared to have advanced knowledge of the questions asked. In order to adequately challenge students, it may be necessary for judges or course instructors to prepare and ask appropriate, rigorous questions for each debate.

Overall, student performance in debate has been found to be impressive. In most cases teams came to each debate very well prepared. The essential controversial issue was usually identified by each team, and key evidence from the scientific literature was presented. Constructive and rebuttal speeches were often found to be quite eloquent, even passionate. The preparation necessary to compete satisfactorily in debate appears to build (in most instances) group cohesion and cooperation. Most students appear to enjoy participating in the debate, and audience reaction is often lively (in stark contrast to their behavior during lectures!).

Of course, the debate format also presents challenges and problems. The success of the debate depends on student interest and preparation. Teams who are uninterested and/or ill-prepared are unable to engage in good debate. This attitude is usually exposed by the end of the debate. It must also be accepted that not all students will put in equal effort to prepare. This problem may be relieved in part by the inclusion of peer review to assign some portion of the debate grade. In the end, however, the inherent determination of most students to obtain a good grade

Table 1. Rules of Debate

Rule 1. The Teams

Two teams will choose (or be assigned) to debate a significant controversial issue. Both teams must come to the debate prepared to argue on both the affirmative and negative sides of the issue. The affirmative team will be chosen by the course director on the day the debate is scheduled. Each member of the team must participate by giving a constructive speech, an answer to a question or a rebuttal speech. (Note: The structure of the debate described below assumes teams of 4-6 members. This structure can be altered to accommodate teams of differing sizes).

Rule 2. Components of the Debate

- The number of speeches and speaking time will be divided evenly between the two teams. All team members must participate in the debate by either presenting a constructive speech, a question, answering a question, or presenting a rebuttal. *Please note: all speeches must be given using a reasonable volume and cadence so as to be understood clearly by a listener sitting at the back of the room!*
- Each team will have three minutes for constructive speeches.
- Questions will be asked of each team by any or all of the judges. Each team will have one minute to discuss an answer between team members and one minute to provide a formal answer.
- Each team will have two three-minute rebuttal speeches.
- The affirmative gives the first constructive speech, and the constructive speeches then alternate between affirmative and negative.
- The negative gives the first rebuttal speech, and the rebuttals alternate: negative, affirmative....
- The debate is strictly timed as illustrated below:

	Time (minutes)	
	Affirmative	Negative
Constructive speech 1	3	3
Constructive speech 2	3	3
Constructive speech 3	3	3
Question 1	1	
Answer 1		2
Question 2		1
Answer 2	2	
Question 3	1	
Answer 3		2
Question 4		1
Answer 4	2	
Rebuttal speech 1	3	3
Rebuttal speech 2	3	3
Time	21	21
Judging	2 minutes	
Total Time	44 minutes	

Rule 3. The Topic

- The topic requires the affirmative to support the controversial statement.
- The affirmative has the right to make any reasonable definition of each of the terms of the proposition as defined by professionals in that field of study. If the affirmative's definition is not reasonable, the negative should challenge it at the earliest opportunity.
- If the negative challenges the reasonableness of a definition by the affirmative, the judge(s) must accept the definition of the team that shows better grounds for its interpretation of the term.
- Once the negative has accepted the affirmative's definitions, it may not later object to them, even if they later turn out to be unreasonable.

Rule 4. Positions of the Teams

- He who asserts must prove. This principle applies equally to both teams.
- In order to establish an assertion, the team must support it with enough evidence and logic to convince an intelligent but previously uninformed person that it is more reasonable to accept the assertion than to reject it.

- c. Facts (data such as graphs, figures, tables) presented in support of an assertion must be accurate.
- d. The use of readable visual aids (overheads, slides, etc.) are encouraged. Once introduced, visual aids also become available for use by the opposing team.

Rule 5. Questioning

- a. The questioner may ask any fair, clear question that has a direct bearing on the debate. Answering only with a yes or no is not allowed. All answers must be justified.
- b. The questioner must confine his- or herself to the question. Statements or comments are not allowed.
- c. The answering team can confer about the question provided the answer is given within the allotted time. The answering participant must give as short and clear an answer as the question warrants. The justification for the answer must be explained.

Rule 6. Rebuttal

- a. No new constructive arguments take place in any part of the rebuttal.
- b. The rebuttal period is a time to point out the weakness in the opposing team's arguments and to summarize your team's position.

Rule 7. Reference Lists and Summations

Before beginning each debate, each team must provide the course director and all other groups in the class one copy of the following documents:

- a. A list of the major research articles used as a resource to prepare for the debate (include authors, title, journal, volume, and pages).
- b. A succinct "brief" or "summation" (no more than two single-spaced pages) describing the background and evidence that supports both sides of the controversial issue. These summations will provide the content for examination.

Rule 8. Judging

- a. The team doing the better debating is the winner.
- b. Teams will be judged by the following criteria (20 points each):
 - 1. Preparation
 - 2. Quality of visual presentation
 - 3. Quality of reference list and written summations
 - 4. Quality of answers to questions
 - 5. Quality of rebuttal
- c. Judges will base scoring entirely on the material presented, without regard to knowledge they may happen to possess.
- d. Judges are required to accept as true all arguments backed by reasonable proof until such arguments are overthrown by the opposing team.

Rule 9. Non-Debating Teams

Teams not involved in debate must be present for all debates. Each student in class will be responsible for the material presented during the debate, which will serve as the content for examination.

A note about visual aids. The quality of presentation can be greatly enhanced by excellent graphic presentation. The judges will pay close attention to graphics when scoring debate presentations.

usually motivates them to prepare well for this activity.

Judging of the debate can also present interesting challenges. This is especially true when both teams present excellent debates or when the expertise of the judge(s) is limited with respect to specific issues debated. A pass/fail system is probably the preferable form of grading, although this may not sit well with students indoctrinated into traditional grading systems.

Incorporation of formal debate into a course requires provision of adequate class time. However, time limits can be adjusted to accommodate specific situa-

tions. Thus, a single debate can be organized to last as long as one hour or to be as brief as fifteen minutes.

Students' Perceptions of the Debate Experience

A survey was conducted with the members of a recent class (n=81) who had just engaged in the formal debate to gauge their perceptions of the debate experience. A summary of the outcome of this survey is presented in Table 3. In general, most of the

students appeared to accept the debate, with the percentage of students either strongly agreeing or agreeing with the statements ranging from 39 percent to 76 percent. Of the 81 students who responded to this survey, 62 (76 percent) either strongly agreed or agreed that participation in the debate helped them to realize that most issues are not clear cut; 48 (59

percent) agreed that the debate stimulated their interest in the debate topic; and 52 (64 percent) agreed that most team members put in a reasonable effort in preparation for the debate.

A total of 25 students also offered critical comments. Ten of these comments favored the debate experience. For example, one student commented that

Table 2. Controversial topics appropriate for debate in courses in preventive dentistry or oral biology

Be it resolved that:

1. The use of antibiotics to prevent subacute bacterial endocarditis in humans is efficacious.
2. Public water fluoridation promotes the development of bone cancer.
3. Occlusal dysfunction is an important contributor to periodontal attachment loss.
4. Mercury in dental amalgam causes systemic disease.
5. Dental sealants are cost-effective measures for preventing caries in school-aged children.
6. Periodontitis is a continuously progressive and chronic infection.
7. Tooth polishing is essential prior to the application of fluoride.
8. Detection of incipient caries requires the use of an explorer.
9. Non-surgical therapy is as effective as surgical therapy in the treatment of periodontal disease.
10. Dental water lines are a risk to the health of dental patients.
11. Baking powder and hydrogen peroxide used together are clinically effective in reducing plaque accumulation.
12. Fluoride use is the major cause of the worldwide decline in dental caries incidence.

Table 3. Summary of questionnaire assessing students' perceptions of their debate experience

Question	Average of student responses	No. of students responding with a 1 or 2
1. The debate stimulated my interest in the debate topic.	2.6*	48
2. Preparation for the debate gave me valuable experience in literature searching.	3.0#	31
3. Participation in the debates helped me realize that most issues are not clear cut.	2.1†	62
4. Most of my team members put in a reasonable effort in preparation for the debate.	2.4‡	52
5. I learned much from listening to and reading about the other debate topics.	2.8#	39
6. I enjoyed participating in the debates.	3.0#	33

Students (81 of 85 students responded to the survey) were asked to give their reactions to the following statements using the following Lichert scale: 1. I strongly agree; 2. I agree; 3. I neither agree nor disagree; 4. I disagree; 5; I strongly disagree.

ns—not significantly different from 3 by 2-tailed t-test

*p<0.01

‡p<0.001

†p<0.0001

"they [the debates] were a pain to prepare for, but fun to do." Another student stated that "even though I hated preparing for the debate, I really felt like I accomplished something when it was over."

Several students commented critically about different aspects of the debate process. Four students suggested that "each team should be told what position to take (either pro or con) ahead of time to properly prepare (for the debate)." Two students argued that they should not be forced to speak publicly during the debate. Three students expressed their preference that the debate be abandoned in favor of lectures to cover the same content.

In summary, debate offers an interesting opportunity for students to develop many important learning and thinking skills. Debate can be incorporated within a course along with other active learning strategies (problem-based learning, group learning, case discussion, etc.) to diversify learning experiences. Such an activity can bring a welcome element of excitement into the classroom and at the same time help to provide our students with appropriate skills to cope with the problems of an increasingly complex world.

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