Utilizing Debates as an Instructional Tool for Dental Students

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Abstract: Debates have been used as an instructional tool since 1999 in the Program in Dental Hygiene and are currently used by the School of Dental Medicine at the University of Pittsburgh. The debate format is designed to present a thought-provoking and uncomplicated teaching tool that uses key elements of adult education, such as emphasis on self-learning and its process. The objective of this article is to demonstrate the use of debates as an instructional tool for dental hygiene and dental students. A debate format is presented in detail. Post-debate small discussion groups and a questionnaire were used to explore dental student experiences with using debates as an instructional tool. Dental students indicated that their experiences with the debate format had positive pedagogical benefits. Students reported that their interest in the given topic was heightened and knowledge was improved or reinforced. The debates also appeared to help students organize their thoughts on the presented topics. The debates were reported to be engaging and were received with enthusiasm by the students. Students reported that the debates enhanced their ability to organize and reinforce their thoughts on issues they may confront as dental professionals.

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Arguably, dental education should adhere to principles of adult education. One principle of adult learning is that learners are self-directed as they actively participate in the learning process. One commonly used approach to teaching that aligns with this principle of adult learning is problem-based learning (PBL), in which cognitive conflict stimulates learning and knowledge evolves through social negotiation among the participants in the tutorial group by refinement or restructuring of that knowledge. Effective PBLs, however, can be difficult to properly design and require well-trained faculty facilitators. Finding other educational strategies that take advantage of active student participation and adhere to adult learning principles, but require less faculty time and training, could provide welcome alternatives for curriculum designers. One possible strategy that incorporates adult learning theory and active student participation, but may be less cumbersome than structured PBL, is the instructional debate format.

Debate is not a new teaching/learning format; currently, it is an accepted form of instructional delivery at a variety of health professional schools. Ideally, debates should foster development of logical reasoning and communication skills. Ganguli and Rancurello, for example, found that debates between pairs of faculty members encouraged their psychiatry residents to 1) frame unfamiliar or controversial issues in psychiatry, 2) be open to multiple perspectives on issues, and 3) consider the process as an entertaining and memorable educational experience.

Well-designed debates should require students to think, read, and write critically by synthesizing a large number of complex concepts into a coherent, well-researched, and well-supported position before classmates and instructors. There are many forms of debate strategies. An informal debate, also referred to as an expository debate, may be as simple as asking students to come prepared to discuss issues at the next class meeting. Formal debates involve taking a controversial subject, framing it as a resolution statement (e.g., a proposal or recommendation), and requiring one group of students to affirm the resolution and another group to argue against the resolution. Students are then asked to present their arguments in a prearranged (generally by alternating point/counterpoint) and timed format. The purpose of this article is to describe a debate format used at the University of Pittsburgh in both a dental hygiene and a dental medicine public health course and to present student responses to its use.
Methodology

Use of Debates in the Program in Dental Hygiene

The Program in Dental Hygiene at the University of Pittsburgh first introduced the debate method to its freshman course in dental public health in 1999. Each class was comprised of twenty-three to thirty-eight first-year dental hygiene students. Students were assigned to four-member groups either in support of a position or opposed to it. The topics chosen and the number of students assigned for each debate depended upon the course enrollment and students’ interest in each topic. Students were given at least two weeks to prepare for each debate, which then took place during a class session. For each debate, the students were advised to collaborate with members of the opposing team since the material may be very new to group members; thereby, each debate would be more coherent and have an improved flow for its audience.

The complete list of debate topics is shown in Table 1. A sample of debate topics, introductory remarks (used strictly to stimulate discussion), and the resolutions used during the 1999–2004 hygiene classes follows.

**The Dangers of Amalgam.** According to the World Health Organization (WHO) and World Health Online, mercury is a substance widely used in common silver dental fillings (amalgams). It is estimated that over 85 percent of the population in the United States have them. Mercury, one of the most toxic substances known, makes up 50 percent of all silver fillings. Silver fillings leach mercury into the body. Studies show that five surface fillings raise normal

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<th>Table 1. Debate topics and resolutions for dental hygiene students</th>
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<tr>
<td><strong>Topic</strong></td>
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<tr>
<td>1. The dangers of amalgam</td>
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<td>2. To fluoridate or not to fluoridate—that is the question</td>
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<td>3. The fear of AIDS</td>
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<td>4. Herbal therapy in dentistry</td>
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<td>5. Dentures ‘R Us</td>
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<td>6. Managed care in dentistry</td>
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<td>7. A question of personpower</td>
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<td>8. The good, the bad, and the ugly</td>
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<td>9. Aesthetic dentistry: the message is the media</td>
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mercury brain level 300 percent, and preliminary tests indicate that they may compromise the immune system. Currently, lawmakers in the United States as well as other countries are drafting legislation that would require dentists to inform patients of the possible hazards of mercury. Resolved: Due largely to their mercury content, dental amalgams have been shown to be a serious health hazard and should be eliminated as a primary dental restorative material.

To Fluoridate or Not to Fluoridate? That Is the Question. Although the positive health effect of fluoride is sacrosanct in the mainstream dental community, there has been much resistance among some segments of the public over the years to the addition of fluoride into water supplies in regard to its “cumulative poisonous effects.” Further, the issue of freedom of choice has been used to attack the implementation of government fluoride programs. Resolved: Water fluoridation is a safe and effective method for primary dental care, and the government should therefore impose mandatory programs to raise all drinking water supplies to optimum levels to ensure public health and welfare.

Dentures 'R Us. As part of the continuing effort to supply low-cost and accessible dental treatment to the public, some U.S. states and Canada have allowed denturists to legally measure, process, and deliver dentures to the public without the middle person (the dentist). Resolved: Denturists are necessary suppliers of dental health care, and denturism should be a legal trade in Pennsylvania.

A Question of Personpower. One of the major problems regarding the public’s access to health care is the lack of availability of health care providers. Although dental hygienists may place dental sealants in the presence of a dentist, they cannot independently provide sealants in a community-wide program. Further, hygienists are not allowed in the Commonwealth of Pennsylvania to provide local anesthesia to patients (including infiltration techniques), thus slowing the dental production pace. Resolved: Dental licensing of hygienists should be modified to reflect the personpower needs of the communities: a) they should be allowed to diagnose the need for and to place dental sealants in community programs independent of direct dentist supervision; and b) they should be able to place injections of local anesthesia either by infiltration or by mandibular block techniques.

In preparation for each debate, the following information was distributed to each dental hygiene student:

The goal of this experience is for you to learn to construct a coherent argument by framing an issue, making claims about the issue, and supporting claims with evidence. Remember that there are always (at least) two sides to every story and, whether you believe the position you are taking or not, it is your job to convince the opposing team (and the audience) that your position on the subject at hand is correct. Previous students have commented that, in fact, they learned more about the subjects with which they did not agree than if they had represented the stance they initially believed in!

There will be six teams consisting of four members each. Teams will be self-selected. You are required to attend all of the debate sessions, so that all of the debates have a full audience. Your grade is not determined by win/lose or your technical debating skill, but rather by a clear, concise, thoughtful, and researched effort. For each debate, the audience will vote in order to decide which side won (not graded). You will receive a group grade, so everyone must contribute an equal share of work on the project.

For the opening statement, one team member may use all the time, or the time may be split between statements by two team members. Similarly, for the rebuttals, either a single team member or more may present. However, each team member must present at least once during the debate.

As in traditional debate, the affirmative side has the burden of proving its case. The negative must simply refute the resolution and need not propose any action on its own.

All research is to be turned in at completion of the debate exercise. A copy of your search history, along with a bibliography, is to be included with your draft.

Your team debate grade represents thirty points toward your total grade for the semester, so be fully prepared.

In Table 2, the format and timetable for the presentations are shown. Although the total time
given for all sections is eighteen minutes, approximately twenty to thirty minutes were needed to allow for setup and audience questions.

The debates were moderated by the instructor, who introduced each participant, kept the debates to the discussed time, and graded each student. Some of the original debates were taped and reviewed for performance and for determining possible improvements to the debate organization and implementation in general. The equally weighted criteria for grading were as follows: 1) the individual presentation, including a clear, concise, thoughtful, researched effort; 2) a copy of a search history/bibliography; and 3) the overall group presentation.

Use of Debates in the School of Dental Medicine

In 2006, the School of Dental Medicine used the debate technique as a course assignment for fourteen third- and fourth-year students who were in a graded selective called “Readings in Dental Public Health.” This selective was designed for students who were either in or were considering entering a dual degree program (that awards both a dental degree and master’s degree in public health). The objective of this assignment was to introduce students to current controversies in dental public health. Since it was presumed that these students were more knowledgeable regarding dental issues than first-year hygiene students, a debate structure was used that required less formal time constraints and allowed students to ask questions during the debate. Nevertheless, the basic time format described for the hygiene students was used as a template. Students were teamed in groups of two to three per side of each topic and were given at least two weeks to prepare for the debate, which was conducted in a classroom setting. The following debate topics were used in this course:

1) Current evidence suggests that water fluoridation remains safe and effective and should be continued.
2) Periodontal disease can be prevented through individual plaque control methods (toothbrushing, flossing, etc.).
3) Utilization of dental therapists in Alaska is a necessary step for providing oral health services to Native Alaskan underserved populations.

After each debate in the dental student course, students were asked to indicate their perceptions of the use of the debate format in this classroom setting and as an instructional tool for dental students. This evaluation took place as small group discussions with faculty, and the attending students also completed a short, eight-item questionnaire immediately following each debate. There were fourteen registered students for the course, but the number participating in the post-debate discussions and filling out of questionnaires was dependent upon attendance at each debate. Post-debate discussion group participants and those who completed questionnaires for the first two debates were eight students each, and those in the third debate group were eleven students. The questionnaires asked students to explore their post-debate opinions with their prior knowledge and opinions regarding areas of interest such as 1) their interest in the debate topic, 2) knowledge of the topic, 3) how the debate helped them to organize their thoughts on the topic, and 4) how the debate helped to reinforce their knowledge on the topic.

Results

In the post-debate discussions and on the questionnaires, students indicated that their experiences with the three debates were, overall, positive and encouraging. For example, several questionnaire responses appeared to indicate that student interest in the topic was heightened and knowledge was improved or reinforced. The debates also appeared to help students organize their thoughts on the presented topics. During classroom post-debate group discussions, students indicated that the debates improved their understanding of and interest in the topics. This was particularly true for subjects that had previously

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<th>Activity</th>
<th>Time Allowed</th>
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<td>Opening statement from affirmative side (side for)</td>
<td>3 minutes</td>
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<tr>
<td>Opening statement from negative side (side against)</td>
<td>3 minutes</td>
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<td>First rebuttal from affirmative</td>
<td>3 minutes</td>
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<tr>
<td>Rebuttal by negative</td>
<td>3 minutes</td>
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<tr>
<td>Final rebuttal from affirmative</td>
<td>3 minutes</td>
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<tr>
<td>Final rebuttal from negative</td>
<td>3 minutes</td>
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<tr>
<td>Audience questions</td>
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not been addressed in detail in the dental curriculum, such as Native American dental therapists. The debates were perceived to be less effective in known topic areas such as community water fluoridation. However, in the discussion of a familiar topic, such as fluoridation of community water, students still indicated that some impact was felt in the area of organization of their thoughts and reinforcement of the material even if they did not feel that their opinions changed due to the debates.

Discussion

This article presents debate as an adjunct educational methodology that complements other course content. In our experience, the results obtained from the questionnaires and discussion groups suggest that the debate format provides an effective and interesting instructional strategy for both dental and dental hygiene students at various levels of their education. By using principles of adult learning, debates offer students an opportunity for self-learning that, in principle, stimulates learning through social negotiation and experiencing the process of working toward understanding or resolving a problem.

Although this report on our use of debate is purely descriptive, it is of interest to note how dental students perceived the debate format as a useful instructional tool. Dental students indicated on the post-debate questionnaires that the debates helped in four learning categories: 1) development of interest, 2) addition to knowledge, 3) organization of thoughts, and 4) reinforcement of previous understanding. Since basic debate requirements include only that the issues have compelling arguments for both sides and that literature be available to support these viewpoints, the number and range of potential issues are quite large. Moreover, contemporary or fast-evolving issues can be explored in a timely manner. Since our last debate on expanded duties for hygienists, for example, Pennsylvania has changed its law regarding independent hygiene practices. The dental debate topics listed in this article include both those that already represent established positions within the dental community and those in which opinion is evolving and no clear consensus exists.

An example of an argument that has overwhelming evidence-based support is that of the utilization of community water fluoridation. On the surface, this may appear to severely limit students who are asked to oppose the use of fluoridation. However, there are many arguments, both supported and not supported by the literature, that may be introduced as viable disagreements within the community. In fact, having to take the position against commonly accepted practice may be key to developing critical thinking skills, as reinforced by student discussions. The generally one-sided evidence in favor of fluoridation may appear to make the fluoridation debate appear rigged, but this makes taking the position against community water fluoridation even more challenging and certainly one with which dentists in the community are frequently confronted. Preparation for the debate allows students to think through the issues and organize their thoughts on the topic, a process that may be useful when confronted by people in their community, anti-fluoridationists, and their patients. Also, since the evidence-based information highly supports community water fluoridation, it is expected that the results would not support a change of position among the students, as shown in the survey.

Based on our observations and interpretations, when issues lack a clear scientific consensus or are controversial, such as the topic of the scope of practice for dental therapists in Alaska, student interest and their ability to discuss these and related issues appear to be slightly increased. This may be due to the novelty of the subject, due to the students’ lack of exposure to the topic, but also may be due to the cognitive stimulation caused by their participation in this form of conflict resolution. Cognitive conflict may be in the form of a student stating a contrary opinion when their alternate view is intelligible and plausible; healthy conflict may then lead to growth, innovation, and new ways of thinking. In contrast, we found that a less structured, informal debate style (no formal time constraints) for third- and fourth-year dental students encouraged discussion and, based on their questionnaire responses and other feedback, appears to be an effective learning approach for these more seasoned students. Using a more structured setting for the freshman hygiene students, who are less familiar with the topics, helped them to stay organized and to debate in a logical and informative sequence. This allowed the material to be presented to the audience (the rest of the class) in an entertaining yet effective format. Finally, due to the temporal nature of debates, new and interesting topics can always be introduced, keeping the debate material fresh and contemporary.

The intent of this study was to explore the possibility of classroom use of debates in a dental school setting. The study was based solely on our ex-
experiences with the debates in our classroom settings and was limited by the lack of a formal empirical evaluation. Future studies would need to be more comprehensive. First, a more formalized post-debate discussion group such as a focus group should be developed to more systematically identify key points and ideas for improvement, such as which chosen topics were deemed more amenable to the debate format and what topics should be considered in the future. Second, a standardized and reliable instrument, such as a pre/post-debate test or other type of questionnaire, should be developed.

Conclusion

Debates are an easily instituted learning format, which adheres to active learner participation and appears to be well received by students. In our experience, debates also appear to be an effective way to introduce complex topics that lack a clear consensus or do not have an unequivocal factual basis and, in so doing, help students develop the capacity to articulate cogent and logical arguments and provide them with opportunities to use complex thinking skills. We recommend that schools consider adopting debate within classes that allow for this type of format.

REFERENCES