

# DEBATES- A TOOL FOR EFFECTIVE ENGAGEMENT OF STUDENTS

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## Abstract

The authors have been continuously fascinated by the role of debates in effective engagement of students. Debates have been well recognized as a valuable tool for the assessment of educational objectives. In the Fall 06 semester, debates were used as a tool for learning the subject in an environmental science course, C010- Environmental Science. Students were asked to make handwritten notes while the debates were on progress. There were six debates in the course. The final examination contained conceptual questions, including the contents of the debates. Except for the handwritten notes, no other sources including text books, electronic versions, or xerox copies were allowed to be used by the students during the final examination. In a survey conducted by the authors, students reported that the debates gave them several chances to study the subject in addition to paying careful attention to the lecture. Improvement in students' grades was taken as the index for the effective engagement of the students.

This method was compared with a control group. Overall the control group had scored 64% on the average, whereas the debates group scored 73% in the course. The debates group showed 14.1% improvement over the control group. In a two-tailed t test the calculated t value was 2.7. The improvement of the debates group was statistically significant at an alpha value of 0.05. The result of t test confirmed that debates are a powerful tool in effectively engaging the students. The authors plan to extend the application of the debates concept to three other courses over the next three years.

## Introduction

Schools, colleges, and universities are increasingly turning to the assessment of learning outcomes to evaluate the effectiveness of their programs. Debates could be used as an effective tool for the assessment of educational objectives.

## Methodology

In the Fall 06 semester, debates were used as a tool for learning the subject in an Environmental Science course, C010. The students were encouraged to make handwritten notes during the debates. There were six debates in the course. Each debate was a half hour long session. The final examination contained conceptual questions, including the contents of the debates. Except the handwritten notes, no other sources including text books, electronic versions, xerox copies were allowed to be used by the students during the examination. Improvement in students' grades was taken as the index for effective engagement of the students.

In order to evaluate the improvements we need to make sure that we are comparing apples to apples only. This was obtained by replacing the thirty percent grade of the mid-term examinations in the traditional method with the same amount of grade in the debates method. The traditional lecture format and the debates method have seventy percent of their grade as the same requirements. Except for this, there was no difference between the two methods. The level of difficulty for seventy percent of the grade was the same in both courses. This was established by the design of the overall course grading formula shown in Table 1. Both the courses were taught by the same instructor. In the debates method, six debates were conducted, each debate consisted of 5% of the grade.

Students were asked to rank several activities on a scale of 1 to 5, 1 being to disagree strongly and 5 being to agree strongly. The survey consisted of ten activities ranging from students having never taken debates before to debates improving the student's grade on the final (Table 2). Table 3 shows a list of recommended debates [1-4]. The students are allowed to choose their own topics which would be approved by the instructor after checking for their appropriateness.

Since the t-test is an excellent tool for comparing the means of two groups, this was used to compare the mean of debates method over the control group [5, 6]. While conducting the statistical analysis, the effect of differential sample sizes and the minimum required number of samples have been taken care of [5, 6]. This method was compared with a control group class in Fall 05. t test was conducted to determine the statistical significance of debates in improving the course grade.

## **Results and Discussion**

None of the students took debates in any other courses. This was a novel concept to them. A majority of the students strongly agreed that debates would improve their final grade, debates are a time consuming process, they would recommend debates to other courses, and they took notes during the lecture. A majority of the students strongly disagreed that debates are useful only in science courses, extensive reading of the text was not required because of hand written notes, read the text and prepared notes ahead of lecture, did second round reading after the lecture, and integrated and organized the notes.

This method was compared with a control group class taught in Fall 05. Overall the control group had scored 64% on the average, whereas the debates group scored 73% in the course. The debates group showed 14.1% improvement over the control group. In a two-tailed test the calculated t value was 2.7. The improvement of the debates group was statistically significant at an alpha value of 0.05. The result of t test confirmed that debates are a powerful tool in effectively engaging the students. The authors plan to extend the application of the debates concept to three other courses over the next three years.

Debating is time consuming because students had to conduct research, make notes and prepare more than the traditional method. Debates can be used in any course as they provide a thorough learning experience for the student. The results of the t test are shown in Table 4.

## **Conclusion**

In the survey conducted by the authors, students reported that the debates gave them several chances to study the subject in addition to paying careful attention to the lecture. They indicated that they got the opportunities for learning the subject before the lecture, after the lecture and just before the test. The result of t test confirmed that the debates are a powerful tool in learning the environmental science subject.

## **References**

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**Table 1. Grading Formulas**

	Control group (Percent)	Pretest group (Percent)
1. Assignments	20	20
2. Attendance and class participation	10	10
3. Mid-term examination	30	0
4. Final Examination	40	40
5. 3 Pretests		30
Total	100	100

**Table 2. Student Survey on the Activities of the Chapter**

Please rank the following activities on a scale of 1(strongly disagree) – 5(strongly agree).

S.No.	Activity	Ranking	Relative Ranking
1	Never took debates in other courses	3.8	6
2	Read the text and prepared notes ahead of the debates	2.5	7
3	Took additional notes during the debates of other teams	3.9	5
4	Did the second-round reading after all the debates and integrated and organized the notes	1.9	8
5	My notes helped me score higher grade	4.4	3
6	Extensive reading of the text was not required because of hand-written notes	1.7	9
7	This is a time consuming process	4.2	4
8	Debates will improve my grade on the final	4.5	2
9	Debates are useful only in Science courses	1.2	10
10	Will recommend debates for other courses	4.6	1

Comments:

**Table 3. List of Debates [1-4].**

1. Should DDT be banned worldwide?
2. Will Hydrogen end our fossil fuel addiction?
3. Can pollution rights trading effectively control environmental problems?
4. Should people eat lower on the food chain?
5. Do environmentalists overstate their case?
6. Should the gasoline tax be raised?
7. Is science and technology helping or damaging the environment?
8. Should the government suppress all the wildfires at the beginning?
9. Can the world produce enough food for Africa? Should it?
10. Can we feed the world?
11. Can we make recycling a financially viable industry?
12. Any other pre-approved topic chosen by the students' team

**Table 4. t-test Results for the Effectiveness of debates**

	Average Grade on the Final	Number of Students
Control Group	69%	11
Debates Group	76%	12

$$t_{\text{calculated}} = 2.7$$