

AC 2008-2407: COMMERCIAL BREAKS IN THE CLASSROOM

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“Commercial Breaks in the Classroom” by Seth Norberg

Abstract

After teaching a required undergraduate thermal-fluid systems course in the spring of 2006 to a broad assortment of engineering students at the United States Military Academy, many of whom saw no point in their enrollment in the course, various methods were attempted to spur their interest, keep their attention, and liven the discussion. The necessity of a “commercial break” in the classroom was recognized. “Commercial breaks” consisted of demonstrations, slide shows on the topic, an engineering story, a military story, or a personal story programmed at the half way point of the lecture. After collecting data in the fall of 2006 and the spring of 2007, the results showed that students appreciated the effort as indicated in the 93% positive responses to the overall attempt. The majority found commercial breaks to be an effective and enjoyable way to break the class. The commercial breaks also expedited development of rapport with the class. The students were more attentive and livelier after the break and the class was much more enjoyable for everyone. In addition, the performance of the sections was at or above the overall course performance.

Introduction

About a third of the faculty at The United States Military Academy is rotating faculty members from the active Army. These officers enjoy a three year tour after completing their master’s degrees. After an instructor workshop in the summer, I was unleashed upon cadets. Teaching three sections of thermal-fluid systems to 46 students, I had the typical successes and failures of a first year instructor. The class consisted of predominately students majoring in mechanical engineering. My second semester, I had three sections of thermal-fluid systems again with a similar number of students. This time, however, the course consisted mainly of non-majors. Most of these students saw little point in taking my course and openly questioned the merit of my course on both their academic career and their life. I attempted various methods to spur their interest, keep their attention, and enliven the discussion. I saw the value in developing a rapport with the students and also answering the “so what” question that the challenging student so often poses. In short, I saw the necessity of the commercial break in the class room.

Research shows that the college age student initially has a 15-20 minute attention span which becomes shorter as the lecture progresses [5] & [10]. Further research showed that students recalled 70% of the information presented in the first 10 minutes of class and only 20% from the last ten minutes [6].

Changes in the environment recruit attention. The ability of changes to capture attention can work to the advantage of the lecturer. Variation in pitch, intensity, and pace of the lecture, and visual cues such as gestures, facial expression, movement to the blackboard, the use of demonstrations or audiovisual aids—all of these recruit and maintain attention to the lecture.—McKeachie [6].

Expanding on McKeachie's statement and focusing on changing the environment, I realized that many of the demonstrations, slide shows, movies, and stories could be pre-planned to coincide with lulls in the lecture. The primary means of instruction was writing on the blackboard. Based on McKeachie's recommendation, the commercial break served as a means to change the environment. Depending on which students had drunk their morning coffee, the breaks served to either maintain or recruit their attention. These breaks consisted of demonstrations, slide shows on the topic, engineering stories, military stories, or personal stories pre-programmed for at least once during the 55 minute lecture.

Examples

The demonstrations ranged from a cold can of soda (showing closed vs. open system) to an exploded view of an air conditioning Brodhead-Garret device.

Slide shows included PowerPoint slides of photos of the topic or key points. For the Bernoulli equation / pitot-static class, photos of pitot tubes on different aircraft were shown. Typically the slides were used when the device analyzed was too large to be a demonstration.

Engineering stories consisted of my limited experiences in the lab or working in industry. Background history on how an experiment was conducted or the scientist behind it also worked well. Joule's experiment proving that the internal energy of an ideal gas is a function of temperature alone provided an opportunity to discuss Joule. The term "horsepower" and James Watt were another well received story.

Military stories attempted to show the concepts from class in military technologies as well as soldier initiatives—cooling water bottles by putting them in a wet sock highlights evaporative cooling and was shown to me by one of my NCOs. The cadets crave information on all aspects of military life.

Personal stories included, "so there I was driving through the middle of Texas in July and my engine temperature gage was moving up fast—What did I do?" to highlight how an engine is cooled as well as the occasional topic of the day, "why are you so tired today?" and the response of "there was a surprise inspection at 0400 this morning."

Regardless of the type of commercial break, the environment of the class needed a change from board work. By stepping away from the blackboard, their pencils went down and their eyes came to me.

Survey Overview

The students were asked for feedback at the end of the semester on five types of commercial breaks (demonstration, slide show, engineering story, military story, personal story). The first question asked how "effective" they found that type of break ranging

from 1-5 (one being the lowest score and five being highest). The second question asked how “enjoyable they found that type of break. Four free text questions followed asking “which type of break did you find the most effective”; “which type of break did you find the least effective”; “comment on the overall attempt of introducing commercial breaks”; and “give any suggestions for future commercial breaks”.

First Iteration

Fall semester of 2006 (AY07-1), the author had two sections of Thermal-Fluid Systems I (ME311). Based on the plan introduced earlier, during the majority of the lessons, some type of commercial break was conducted. During an early lesson in the semester, an impartial visitor remarked, “the class actually perked up the last ten minutes of class” following a demonstration of a closed system with a work input that resulted in a temperature rise within the closed system.

The results from the semester are shown below, the two sections were asked how effective the commercial breaks were and how enjoyable on a scale from one to five.

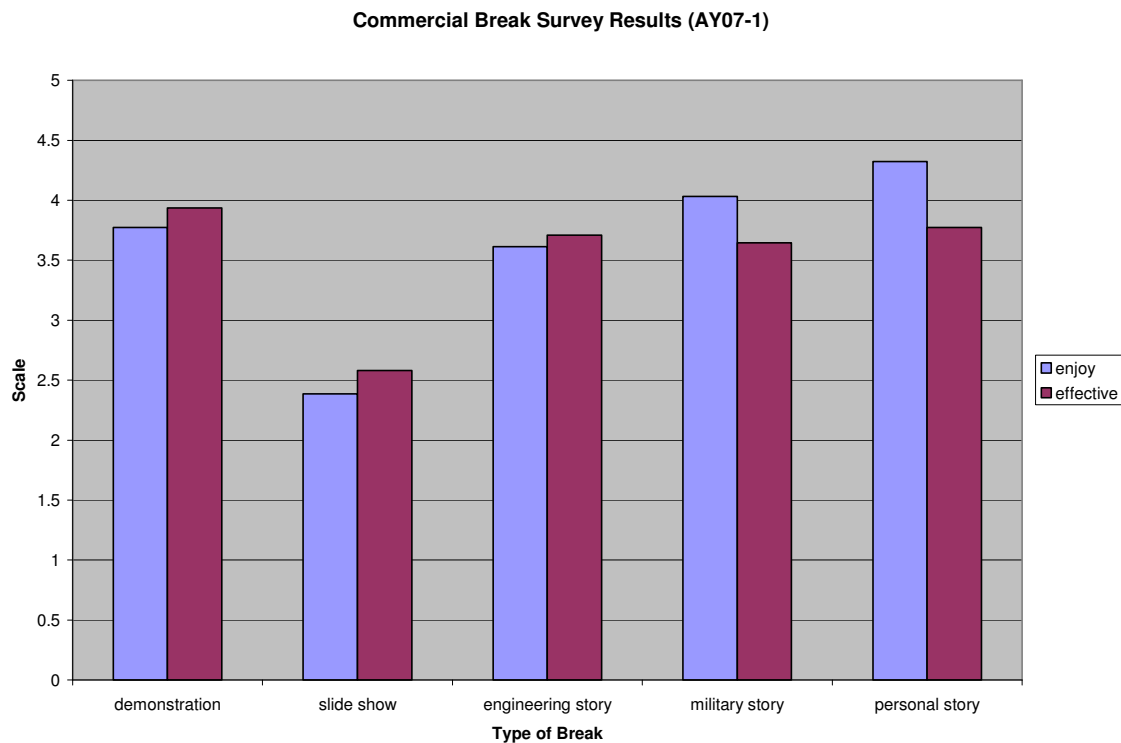


Figure 1: Commercial Break Survey Results from Academic Year 07-1

As expected, demonstrations were more effective than enjoyable and personal stories were more enjoyable than effective for the class.

“Visual demonstrations helped to make concepts more understandable and applicable”

“Demonstrations were great because it solidified the theoretical concepts of what we learned.”

Prior to conducting the survey, my initial thought was the effectiveness of the demonstration would be rated considerably higher than any of the stories, especially personal story. However, that was not the case. Each of the stories was relatively effective and considerably enjoyable.

“I think they (stories) were refreshing. They actually got me interested again.”

Second iteration

Heartened by the feedback from the initial attempt at commercial breaks, I decided to continue using commercial breaks despite teaching a new course during Spring semester. Keeping the same format for the survey, the trends as far as enjoy vs. effective remain the same, however, the overall score was markedly higher. As a group, the students were much more receptive to the personal and military stories. One interesting side note is that the incoming GPA for the spring semester students was considerably higher than the incoming GPA for the fall semester.

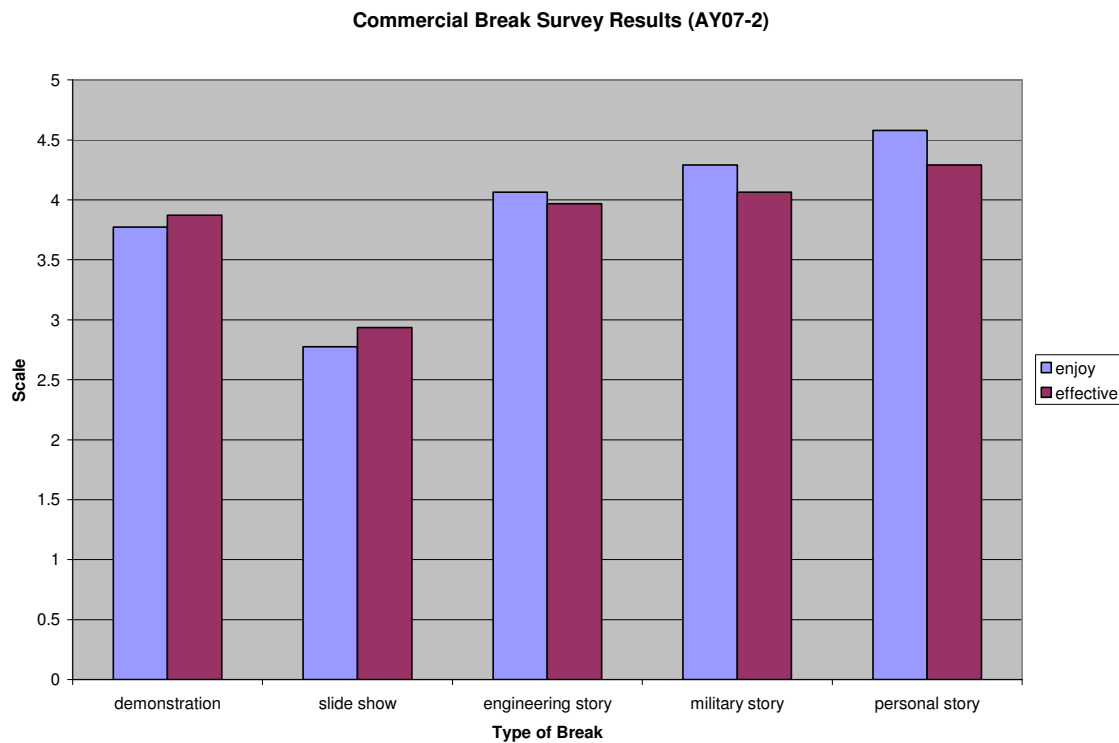


Figure 2: Commercial Break Survey Results from Academic Year 07-2

Feedback Analysis

The first free text question asked the students to comment on the most effective commercial break: 30% said demonstration and 37.5% said personal story which supports the results in figures 1 and 2. Interestingly, the second semester found the personal stories more effective than the demonstrations. Needing the breaks to wake up, the first hour of the day section contributed most to those results.

The least effective commercial break was the slide show that was detested by the majority (45%) of cadets. From personal experience, once started, two or three students would almost instantly start fading. One student comment referenced “*death by PowerPoint*” in a previous course as to the immediate disdain for the medium. While slides in general were not well received, videos were requested by 36% of the students.

“Slide shows really do not catch my attention very well. I think it is a bi-product of military science.”

An additional two questions requesting comments on the attempt and suggestions for future commercial breaks yielded some interesting responses. There were no negative responses regarding the overall attempt (93% positive).

“The off beat pace and other ‘aside’ were a great way to keep me into class.”

Suggestions for future commercial breaks included requests for more videos (36%) and having the students lead the breaks—so instead of my planned break, let a student bring a demonstration (I had one student bring a modified potato cannon to show how pressure drives flow) or tell the story.

An additional source of feedback is the academy survey collected at the end of each semester. Shown in Figure 3 is the reason for the introduction of commercial breaks (highlighted in the data from AY06-2). The feedback continued increasing after the second installment, spring semester, of commercial breaks. One reason for the possible increase is the break was often taken when the class “decided” it needed one.

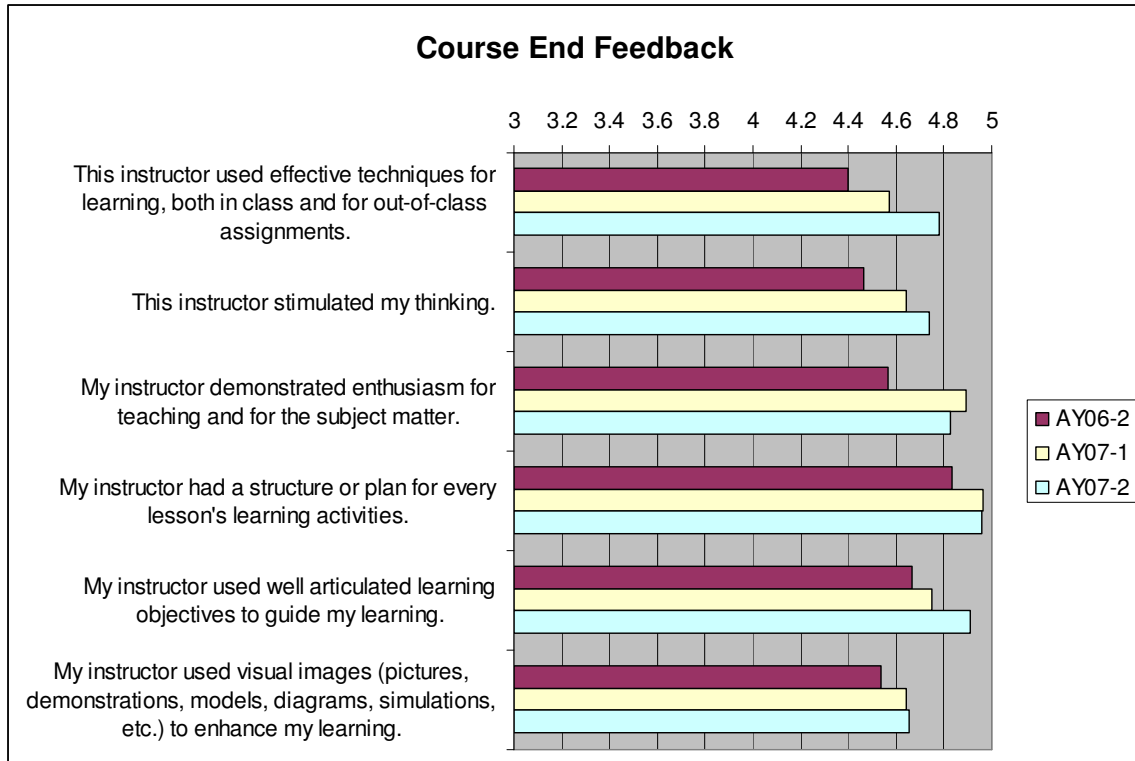


Figure 3: Course end feedback for AY06-2, AY07-1, and AY07-2

“Good introduction into commercial breaks, usually let us dictate how / when we would take a natural break which was good”

One unintended by-product from these commercial breaks, in particularly the stories was the increase in interpersonal rapport with the class. Lowman [7] introduces a two dimensional model of effective college teaching that has two dimensions: intellectual excitement and interpersonal rapport. Despite Middendorf and Kalish’s [5] protests to the contrary, these stories served to break the ice with the class and jump started rapport building. Often the stories lead to students staying after class to continue the discussion. Designating a few minutes to showing your personal side every couple of lessons will not diminish your level of intellectual excitement, but it will do wonders for your interpersonal rapport with the class.

“Personal story—it is fun to see what Seth (the author) is like behind the greens.”

“I like how you interact with us and show personality. Many teachers don’t.”

By raising the interest level of the class, the performance of the students increased as well. Over the two semesters teaching the course, looking at the incoming GPA of the section to the outgoing GPA of the section, the overall GPA raised each semester. Compared to the course incoming versus outgoing GPA, the effectiveness of the commercial breaks is inconclusive.

One note on the grading, our department philosophy is one instructor grades one problem for each section of the course. Therefore, the students turn in the same assignments, take the same tests, and have the same graders.

Shown in Table 1 below, each section had a positive GPA increase and was equal to or above the overall course enrollment increase with the one exception of the already extremely high incoming GPA of G hour of ME312. The impact on the academic performance of the commercial breaks can be debated—it is about equal to the increase of the entire course enrollment. However, the feel of the class and the rapport developed made the semester more enjoyable for both the students and the instructor and did not impact negatively on academic performance.

	ME311			ME312		
	G Hour	I Hour	Course	G Hour	I Hour	Course
Incoming	3.2	3.08	3.16	3.6	3.25	3.32
Outgoing	3.29	3.24	3.26	3.67	3.52	3.44
Increase	0.09	0.16	0.1	0.07	0.27	0.12

Table 1: Student GPA by section and compared to course

Conclusions

The students appreciated the effort as indicated in the 93% positive responses to the overall attempt. The majority found commercial breaks to be an effective and enjoyable way to break the class. The commercial breaks also expedited development of rapport with the class. The students were more attentive and livelier after the break and the class was much more enjoyable for everyone. In addition, the performance of the sections was at or above the overall course performance.

“I liked the relaxed atmosphere of the class because it made it more fun to learn. Also, I liked the “commercial breaks” because they broke up the material and made it seem more personal than West Point generally does. I also enjoyed all of the material.”

“Excellent addition to the classroom environment.”

Acknowledgment

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