

AC 2009-1966: CURRENT-EVENTS ARTICLES FOR ENGINEERING STUDENTS

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Current Events Articles for Engineering Students

Abstract

For the past year, a group of students and faculty have been engaging in weekly discussions regarding articles from Tuesday's Science section of the *New York Times*. This initiative was started to foster general science and educational literacy among engineering students, as well as to better engage students and faculty in discussions regarding current topics and issues confronting society as a whole. The group meets weekly for a lunch meeting to discuss a subset of the week's articles. One faculty member is responsible for identifying approximately four articles each week that form the basis for our initial discussion. The specific articles that will be discussed are determined by a vote at the start of the meeting as students get their food and drink.

Introduction

A group of engineering students and faculty have been engaged in a weekly discussion of articles from the 'Science' section of the *New York Times*. This is facilitated through the *New York Times* student readership program. The program supplies free copies of the newspaper to students (and faculty) on college campuses. It provides a forum for students and faculty to engage in discussions surrounding the current news, each bringing their own expertise and opinion to the group.

The weekly forum, funded by the college of engineering, provides food (pizza) and drink for all interested students and faculty. Students and faculty have a chance to meet informally outside of the classroom environment and discuss current topics that are directly relevant to the fields of science and engineering. Advertisements for the forums are distributed throughout the college, and several upper-division engineering courses require some level of participation.

Background

The reading group described in this paper is meant to provide an informal forum for students and faculty to discuss contemporary issues. This interaction, and anticipated reduction in communication barriers between faculty and students, is considered to be one of the primary reasons for the existence of this group. At the same time, faculty members and engineering programs can use our reading group to assess ABET criterion 3, outcome j, a knowledge of contemporary issues, by making assignments that involve attending and discussing a news article with the group. The ability to measure this type of knowledge gain is important. In 2007, a study involving a small number of senior students in eight different engineering programs found students to be relatively unaware of contemporary issues in their field and unaware of current global concerns¹. Their ability to communicate and participate in discussion without either dominating or withdrawing was also a problem.

Faculty members are addressing measurement of knowledge of contemporary issues in a variety of ways. Two ways for assessing this knowledge involve courses at the freshman level^{2,3} or in senior design^{4,5}. Courter and Johnson looked at forty students in a basic communications course that were also part of a first-year interest group (FIG) that involved common linked courses.

FIGs essentially provided a learning community for students engaging them both intellectually and emotionally. During this two year study, retention rates of first-year students increased from 60 to 80% indicating the enhanced environment that a sense of community provides³.

Contemporary issues can be incorporated into any course by assigning a topic and requiring the student to relate the topic to the subject of the course and to a contemporary issue. When students were allowed to choose their own topic in a heat transfer course and give a short presentation, more enthusiasm for the subject and increased class discussion was observed⁶. When additional credit was given to students with a range of reference materials, students were not simply pulling all resources from the web⁶. An optoelectronics course was the forum for assessing outcomes of lifelong learning and contemporary issues with a research project involving a literature review, homework, and discussion termed 'Fabulous Fridays'⁷. Rather than picking any one course, problem-based learning (PBL) experiences are useful methods for teaching ethics, societal impact, and contemporary issues throughout the curriculum⁸. A review describing creative methods for teaching and learning these skills are given by Shuman et al⁹. Student focused e-learning courses¹⁰ as well as ePortfolio approaches¹¹ have been useful for placing responsibility of the student on communicating knowledge of the ABET outcomes that are difficult to assess.

Still others have attempted to address contemporary issues and other ABET outcomes by creating soft skill modules that can be included in any course.^{12,13} When lumped with ethical and societal impact modules, assessment of the contemporary issue module showed that student confidence when dealing with these topics went from an average pre-module score of 3.7 to a post module score of 4.3 on a 5-point Likert scale. Another approach has been to combine study of contemporary issues and ethics through case studies.^{14,15} Authors discussed the challenges of teaching a truly contemporary ethical case study, where new information became available every day. Needy introduces students to the impact of contemporary issues on project management by including articles from the *Wall Street Journal*, *Business Week*, and the local paper as discussion topics in her engineering management course.¹⁶

Implementation

Prior to starting the actual meetings each semester, it is necessary to identify a time and location for the meetings and to publicize these events. Setting the time for the meeting is challenging. The day is selected based on availability of the faculty involved in the discussion. Sometimes this leads to conflicts for many students. Initially lunchtime/early afternoon was chosen since students may have a break around this time. One of the minor encouragements for students to participate is that pizza and drinks are provided.

Once the time and place were determined, the meetings are advertised through e-mails to engineering faculty, student organizations, and by posting flyers. Encouraging students to attend the event provided faculty with an opportunity to discuss the importance of knowledge of contemporary issues to practicing engineers. It also provides a method for faculty to include Contemporary Issues as part of a course grade without having to do something that seems artificial during class. Students tend to value activities that are reflected in their grades, and an example of this implementation follows with samples of student work.

Each week, one faculty member has the task of making an initial pass through the Science section and identifying a set of potential articles for discussion. Once this set of articles is identified, this selection is distributed via e-mail to all participants (current and past) in the reading group. Students can either read the Tuesday *NY Times* in print or access these articles electronically to prepare for the meeting. However, some weeks due to busy schedules and difficulty in finding papers, not everyone reads the articles before we meet. Lively discussions are still possible in this case.

Obviously, regular attendance is critical to the success of this venture. We have been running the program for three semesters, with attendance averaging about fifteen students and four faculty members. A good week will draw 20 to 25 students; a bad week will draw 6-8 students. As mentioned previously, several faculty members with senior design courses either give extra credit for participation or require attendance as part of their course grade. A portion of a syllabus illustrating this practice is shown below.

Contemporary Issues: There will be weekly discussions of science articles in the NY Times every week, starting the second week of classes, day TBA, at 12:30 and free pizza will be included. You will find in your career that technology and society can change quickly and slap you in the face if you're not paying attention—we'll talk about this more later in the semester. You are required to attend five (5) of these discussion sessions during the semester, and to submit a paragraph or two about the main ideas discussed to me by e-mail (1% of your grade each). If you have a class conflict at the time of the discussion, you will be required to submit five essays – a paragraph summarizing a science article in the NYTimes, and a paragraph giving your comments about it, again 1% each.

Discussions are not dominated by either students or faculty, and cover a wide range of issues. It is not uncommon to find the students educating the faculty on new trends in electronics or other commercial products. Faculty can provide an interesting historical perspective to many issues being discussed. Discussions have a tendency to drift. For example, a recent discussion on the mechanics of avalanches included the following components:

- A summary of the article
- Snow and ice and what students knew about the fundamentals of each
- Whether characteristics of avalanches were similar to those of mud slides
- Identification of all students who had been snow skiing in the past (none of them)
- Identification of all students who had been water skiing in the past (most of them)
- Discussion of general climate and where students would like to re-locate after graduation
- Qualities that students considered highly when looking for permanent employment

As is apparent from the above listing, while you might start with an article on a specific scientific or engineering topic, students will quickly morph this into a discussion that is relevant to their own interests. Faculty will occasionally try to “steer” the discussion in a specific direction; however, their efforts are not always successful.

Students descriptions of discussions follow:

I attended the NY Times discussion today (Thursday, September 25th) where we discussed receding shorelines on the coast due to hurricanes and new and improved hunter's camo. Questions were asked about if and how homeowners who buy houses on the beach should be insured and if they should even be allowed to build so close to the shore. I believe that homeowners assume most of the risk and that it is their responsibility to make sure they will have the insurance coverage they desire before buying or building a home. Another good point was brought up about government paying the price for hurricane evacuation. I had never thought about the issue, but Martha explained how people may have to evacuate even if they live further inland and that help should be provided by relief organizations or the government. We also talked about newly researched hunters camo that fools the deer's brain into seeing only a crazy pattern instead of a human outline. Although this attire is scientifically more improved than a leaf pattern, the article explained that many hunters would be opposed to the camo because it is not "fashion forward" as the local hunter, Mark, agreed.

"Microsoft Faces New Browser Foe in Google" -- Google is releasing a new free web browser called Chrome to compete with Internet Explorer from Windows. They announced their release of Chrome through a comic book. Microsoft is on top of the browser market at 73 percent. Mostly due to that Internet Explorer is on every Windows PC. We determined that Microsoft needs to start looking to update their software due to the new competitors. Microsoft needs to study the history of IBM and other companies that believed their product would withstand the new competition. Google is at the top of the search engines and believes they can make money through ads with their new web browser. We discussed who uses different types of technology and software.

We first discussed which web browser we use and why. There was a close split between Internet Explorer and Firefox. People use a web browser because it is their preference, the ease of use, and their familiarity of the product. These were the main reasons why people choose which product to use like PC or laptop, windows or mac, type of cell phone, or which edition of Office to use. We also discussed what a PC will look like in 20 years. We discussed if they will have a mouse, keyboard, the size, and the possibility of a computer that will fold to a smaller shape.

And from a student with a class conflict:

"Tapping Into What a Deer Sees, and Doesn't" -- This article talks about the fact that W.L. Gore is coming out with a computer generated camouflage called Optifade. This is supposedly the first type of camouflage that makes the hunter invisible to the deer. In order to know what kind of pattern to use, several experts studied and researched how deer see things. They found that a deer has blurred vision, about 20/40, and they see the world like a human who has red-green colorblindness. Since deer have eyes on the side of their head, they can see about

270 degrees around them. To the human, this new camouflage looks like squares that form together to resemble abstract art. This fabric tricks the deer in 2 ways. First, it causes the hunter to fade into the background. Second, it makes it harder for the deer to recognize the shape of the hunter once they've seen him.

My thoughts on the article are that it seems to be pretty interesting. It reminds me of the paintings that up close look like a bunch of dots but when you stand back, they form a beautiful picture. It's intriguing how scientists have figured out ways to get inside the deer's head and find out how they see the world. The company will probably have problems convincing hunters to give up their old camouflage. Most men would rather take the chance of the deer seeing them than to walk around wearing clothes that look like art.

Summary

We are in the second year of this program. However, we have not applied any formal assessment techniques to determine its merit or value added. Informally, discussions with students indicate that they enjoy discussing issues outside of the classroom with their faculty. Our only metric of success, to date, is the continued regular attendance that we see from the students. We believe this is a positive sign.

While we have not done any formal assessment in the past, we are planning on including this activity in the senior exit interviews of mechanical engineering students this semester. In the past, senior exit interviews in ME found that students indicated that they never did anything related to contemporary issues. The faculty in ME could rattle off numerous topics from their courses, *e.g.* alternative energies, biomedical implants, and a host of others that were clearly contemporary, but the students weren't making the connection that these were truly 'contemporary issues'. So, as a faculty, we discussed the idea that when you talk about hip implants, for instance, you needed to refer to this as a 'contemporary issue.' We are curious to see, now that the students are required to interact with the *NY Times* reading group, if they now believe that they have been exposed to contemporary issues.

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