

# Current Events as a Means to Promote Interest in Engineering

Nora Honken, PhD

University of Cincinnati, honkenna@uc.edu

**Abstract** - Interest in engineering is cited as a major reason students choose to study engineering and lack/loss of interest is cited as a major reason for switching out of engineering. In an attempt to help students maintain or increase interest in engineering during their first year of college, engineering-related current events taken from the American Society of Engineering Education First Bell and other sources were presented at the beginning of each meeting of a freshman engineering class. On a survey completed by 125 students, 79% of students indicated the time spent on current events was worthwhile; 71% indicated learning about current events related to engineering helped them increase interest in engineering. The majority of the students also indicated additional benefits such as learning about the type of work engineers do, gaining an understanding of the social and political environment engineers work in, and the need to be a lifelong learner.

*Index Terms* – Engineering first year, Current events, Interest

## INTRODUCTION

Interest in engineering is one of the top reasons given by students for selecting engineering as a major [1]-[3] and lack/loss of interest is one of the top reasons given for switching out of engineering [4][5]. During the first year of classes at the university where this study took place, students in most engineering programs are required to take general engineering courses such as calculus, chemistry, and physics. As useful as these courses are at helping students develop problem-solving skills and laying a foundation for future engineering courses, they do not represent the type of work many engineers do and fail to help students understand the social and political environment engineers work in or the impact engineers have on society. To help students understand more about engineering and maintain interest in engineering during the first year, a group of students were introduced to current events related to engineering at the start of each lecture of a required engineering course. This

## RELATED LITERATURE

Expectancy value theory [6], a motivational theory, has been used, among other things, to understand students' choice of college major and career [7][8]. Based on the theory, a student's decision to work on a task, whether or not to persist at a task, and the amount of effort to invest in a task are determined by their expectation of success and the value they place on engaging in the task or on the outcome of the task [8].

Presenting current events was related to the value component of the theory. Value can be broken down into four categories: intrinsic, utility, attainment, and cost [9]. Presenting current events was an attempt to increase the intrinsic value of studying engineering by increasing the students' interest in and excitement about engineering.

There are many influences on students and many factors they consider when choosing a career or college major. In multiple studies, engineering students have indicated interest in engineering as a top reason for studying engineering [1]-[3]. In a study at a university similar to the university where the current study took place, students were asked to list their top three considerations when choosing their career. *Holds my interest* was chosen by the highest percentage of students as their most important factor (34%) and was included in the top three (out of nine) factors by the highest percentage of students (64%) [1].

There are also many influences and factors that cause students to switch their college major from engineering. Loss of interest or stronger interest in another major are cited in both qualitative and quantitative studies as a reason students left engineering [4][5].

Considering expectancy value theory and research on factors impacting students' college major choice, it is important for faculty to look for ways to help students maintain and increase interest in engineering. The exercise discussed in this paper was one professor's attempt to help students maintain interest in engineering during their first year of college.

## RESEARCH METHOD

*Procedure*

In spring of 2016, current events related to engineering were presented at the start of each class for three sections of a required freshman engineering course. The course focused on engineering problem-solving and learning Matlab. The majority of the current events were taken from The American Society of Engineering Education (ASEE) First Bell, which is an email containing short descriptions of news events related to engineering. While students were taking a daily quiz at the start of class, a selected group of headlines were projected on a screen in front of the classroom so the students could read the headlines after completing the quiz. After the majority of the students had completed the quiz, the professor highlighted particular events that the professor deemed of interest to the students in the particular section. The presentation of the current events generally took three to five minutes.

During the semester of this study some of the top stories involved the federal government trying to get Apple to create a tool to bypass security on the iPhone of a terrorist, the outbreak of Zika virus, the water crisis in Flint, Michigan, SpaceX landing, and issues related to cyber security and autonomous vehicles. Students in certain disciplines were highly encouraged to further investigate topics related to their discipline. For example, environmental engineering students were encouraged to spend some time reading about the water issues in Flint, Michigan. The sharing of current events was purely for informational purposes and no part of the student's grade for the course was related to the current events. Students were not asked to use the information about current events in any assignment.

Occasionally, students were asked to express their opinion on certain presented current events. For example, after presentation of an article about a company contemplating designing an autonomous vehicle with no steering wheel, students were asked to raise their hand if they would feel comfortable riding in such a vehicle. After discussing the federal government/Apple event, students were asked to take a quick survey to express their opinion on what Apple should do. Again this was not for credit; it was just a way to get students to think about how Apple should respond to the federal government.

*Survey*

During week 13 of the semester, students were asked to take an anonymous survey about the presentation of current events during class. The survey was administered using Qualtrics and no class credit or other rewards were given for taking the quiz.

The first section of the survey presented a list of statements of benefits (see Table I) with the prompt *Hearing current events at the start of class....* Potential responses were 'yes' or 'no'. These responses were chosen over a Likert scale because the intention of the survey was to determine if students saw any benefits of listening to current events. There was no intention to draw any inferences from the data by relating responses to other independent variables or determining which benefit was the strongest.

Students then were asked to respond 'yes' or 'no' to the statement *Class time spent on current events was worthwhile.* To determine what type of events they were interested in, students were asked to write down two current events they remembered. To gain an understanding of students' engagement with the current events, they were asked how often they thought about, discussed or further investigated a current event presented in class. Finally, to understand whether the students would have been exposed to the material if it was not presented in class, students were asked to indicate on a sliding scale from 0 to 100% *What percentage of the current events presented in class do you think you would have heard if they were not presented in class?*

*Participants*

In spring of 2016, students in three sections of Engineering Models all taught by the same professor were asked to take the anonymous survey. A total of 125 out of 154 students completed the survey for a response rate of 81%. Data on gender and ethnicity were not gathered on the survey. The population of students surveyed consisted of 27% female and 73% male; all but a few were first year, first time college students. The students were predominantly Caucasian with no other group representing more than 5%. The population included students from multiple engineering and engineering technology disciplines, and a few students in exploratory studies and business. The university where the study took place is an urban research institution with an acceptance rate of approximately 76% [10].

*Data Analysis*

No inferences or predictions were made with the collected data, thus only descriptive statistics and percentages were calculated. All results were taken from the Qualtrics generated report.

**RESULTS**

Of the responding students, 76% indicated it was worth class time to discuss current events. Table I shows the percentage of students who responded 'yes' to each of the statements after the prompt *Hearing current events at the start of class....* The table is sorted by the percentage of

students who responded ‘yes’. In the table the number at the start of the statement is the order the question appeared on the survey.

The data show the majority of the students had some positive outcomes from this exposure to current events. Among the positive outcomes was that over 70% of the students indicated the presentation of current events helped increase their interest in engineering. The positive outcomes with the highest number of ‘yes’ responses were *Made me think about engineers’ impact on society* and *Helped me understand how some events progress scientifically and politically*.

TABLE I  
PERCENTAGE OF STUDENTS WHO ANSWERED ‘YES’ TO STATED BENEFIT OF EXPOSURE TO CURRENT EVENTS

Percent ‘yes’	Statement
86%	6. Made me think about engineers’ impact on society
84%	13. Helped me understand how some events progress scientifically and politically
81%	4. Helped me understand that engineers work within a social and political environment
78%	11. Made me feel more connected to what is happening in the world
75%	2. Helped me understand what engineers do
71%	1. Increased my interest in engineering
70%	12. Helped me understand the importance of being a life-long learner
66%	5. Encouraged me to look deeper into an event discussed
66%	9. Reinforced the impact of poor ethics in engineering and business
61%	10. Helped me understand the government’s role in advancing engineering through research investments
50%	3. Helped me understand the importance of the Grand Challenges discussed in Engineering Foundations
38%	7. Gave me information about a company I might want to work for
17%	8. Gave me information about a university I might want to attend for an advanced degree

The survey results in Table II show that students had various levels of engagement with the material outside of class. Sixty-nine percent of the students indicated they had investigated a current event outside of class at least once (as a check, 66% answered ‘yes’ in part 1 of the survey that listening to current events *Encouraged me to look deeper into an event discussed*). At least 1/3 of the students spent

time investigating a current event more than once during the semester, even though doing so would not impact their course grade. There seems to have been a small percentage of students (between 6-11%) who were very engaged with the current events and often either thought about, discussed or investigated the current event outside of class.

TABLE II  
LEVEL OF ENGAGEMENT WITH CURRENT EVENTS OUTSIDE OF CLASS

	Never	Once	A few times	Often
Thought about	11%	18%	60%	11%
Discussed	26%	30%	37%	8%
Investigated	31%	34%	30%	6%

On the last question of the survey, students indicated a wide range of exposure to engineering-related current events in their daily routine, not including the exposure in this class. On the high side, one student indicated that he/she would have heard 92% of the current events that were presented in class in his/her daily routine, indicating that only 8% of the events presented in class were something he/she would not have heard if events were not presented in class. On the low side, one student responded with 3%. The average was 39% and the standard deviation was 22%.

Overwhelmingly, the event students recorded when asked to name two events they remembered was the federal government asking Apple to help them gain access to a terrorist’s iPhone. Some other events mentioned with high frequency were Zika, SpaceX, and the water crisis in Flint.

When reviewing the results presented here, it is important to remember that this paper is sharing the results of a survey that was intended to gain an understanding of students’ views on sharing current events by one professor, during three sections of one course, during one semester (and one news cycle), at one university. A different student group being exposed to different news could result in different student reactions.

### CONCLUSION

The initial intention of presenting current events was to help students maintain interest in engineering by showing students the involvement of engineers in events documented in the news. It was hoped that after exposing students to current events they would engage in conversations outside of class and their curiosity would lead them to investigate the events further. The results of the survey indicate that for most students the time spent on current events was worthwhile and that it helped increase interest in engineering while also providing other benefits.

While presenting the current events, many opportunities arose to stress factors related to being a successful engineer,

some of which were captured in the survey. These included the need to be a life-long learner, keeping up to date on advances in your field, learning about companies you are interested in, and the financial impacts to companies and individuals of poor ethical decisions. Since the students in this course had completed a project on the Grand Challenges for Engineering in a previous course, this was a great opportunity to reinforce the importance of and show advances on some of the challenges.

Since current events were presented throughout the semester, there were opportunities to follow some events and steps the government, companies, and/or people were taking. A good example of this was the Zika virus. The day the suspected connection between microcephaly and Zika was in the national news it was discussed in class and later the steps the CDC took to confirm the correlation were discussed. Public reaction, such as the Olympic athletes who expressed concerns for their safety and people who canceled weddings in Puerto Rico, was also discussed. Based on the results of the survey, watching the progression of a current event like Zika had the added benefit of helping students begin to understand how scientific inquiry of an outbreak might progress and the social and political issues that might become important.

Presenting current events in class can also have positive benefits to faculty. All ASEE members get the First Bell emailed to them, making it easy to put together a list of engineering-related current events. Making a commitment to students to share current events increases the necessity to read about current events, which in turn might help faculty stay up to date and could be motivating to them as well.

As convincing as the survey results were, there are some disadvantages to presenting current events; the obvious disadvantage being reducing time to deliver course content. The time used to discuss current events ranged from about three to five minutes per class and was started during the 10 minutes set aside for students to take a quiz over pre-class material. Still, the students who did not think the current events were a worthwhile use of class time were very vocal on the end of course surveys and commented that the time should have been spent delivering course content that was part of their grade. Interestingly, in previous semesters when current events were presented to students but no survey was administered, there were very positive comments about current events (unsolicited and recorded in

the open comment section) and very few students commented negatively.

Based on the results of the survey, the majority of the students gained some insight into engineering and the exercise helped many students increase their interest in engineering.

As with most studies, the results of this study raise new questions. For example, since interest has been related to student retention in engineering, can the proliferation of the practice of presenting current events in engineering classes help increase retention in engineering? Could discussing current events related to ethical issues involving engineers, like the VW emissions scandal, help raise the awareness of the importance of ethics in the profession of engineering? Can faculty demonstrating that they keep up to date on current events help students understand the importance of lifelong learning and keeping up to date on advancements in their field?

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