Mike Mulligan and Mary Anne Come to Class

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It is important in any class to engage the students on the first day. This not only helps to reduce the uneasiness that students feel about an unknown instructor but it helps to set the stage for the remainder of the class. This paper explains what is done in an introductory construction class where a children's classic storybook, *Mike Mulligan and His Steam Shovel,* by Virginia Lee Burton is used to explain many concepts of construction and many topics that will be covered throughout the class. It is hoped that others can benefit from using this book or incorporate similar ideas into their classes.

Key Words: Education, Construction, Engaging Students, Educational Tools

Introduction

Reading "Mike Mulligan and his Steam Shovel," is a fresh and innovative way to start the first day of class of an introductory construction course in Civil and Environmental Engineering (CEE) at Michigan Technological University (Michigan Tech). It not only intrigues the students from the start about the class, but introduces them to many different concepts that will be covered during the semester. This concept of using an ice-breaking tool in the first day of class is becoming more common with instructors as they try to grab the student's attention from the start.

Background Information

Research shows that undergraduate students want to learn as much as they can in the first day of class; therefore they can decide whether to stay in the course. Students are constantly gagging the workload and the teacher as a person throughout the hour, to determine whether they will be fair and reasonable throughout the semester (UCTL, 1996). By captivating the students with something involving the course material, this should help the students to understand what the class will demand from them and tell them a little more about their teacher and what they are like.

In addition, research is showing that by using an icebreaker, they help students bond with their classmates, because of this; they are more likely to stay in school and graduate (McGlynn, 2001). It helps them to form relationships early in the semester and they can then work together in and out of class. (LCC, 2001) This sense of belonging is what the students want to feel and it either makes or breaks the class. Today, students are more confident and believe themselves to be the customer, since they are paying for their degree. They do not want to pay for a class that they feel they will be unhappy in. There are many different ice breaking tools that teachers can use in the classroom, ranging from many different name games to student disclosing information about themselves, scavenger hunts, and more customized ones that cater to the exact class (McGlynn,

2001). All of these bring students together, which encourages them to stay in the class, because they know people in the class. Plus, the instructor is viewed as interesting because they had the activity for the students to perform and it conveys the idea that the instructor cares about getting to know the students. Furthermore, these ice breakers reduce instructor/student anxiety about the subject. In addition, it fosters faculty/student interaction and gives a sense that the student is supposed to participate and the instructor is to listen, which makes students active participants instead of passive ones. (LCC, 2001) This then sets the stage for the class and students are more likely to stay in the course, because they are intrigued.

For example, wind chimes are used to introduce a physics course. Robert W. Harris, a teacher from Roxbury, MA, found this idea from a magazine that listed many activities that can be used in the classroom on the first day. He wanted an activity to teach students about the scientific method. The students were interacting right away by gathering and analyzing data, making relationships, and predictions about the wind chimes. They provided Harris with a great jump into the course and many other concepts that would be later touched on in class (Harris, 2000). Mike Mulligan is applied exactly like the wind chimes in the first day, but is completed with the whole class while the book is read. By reading the book about Mike Mulligan and Mary Anne, it personalizes the icebreaker to the class, by having the book talk about construction. It starts students thinking about the course and relating their own experiences to the book.

Using this concept of an icebreaker in the classroom supports the '8 Simple Rules for Teachers to Motivate' their students. These ideas were developed to help teachers hold themselves to a set of guidelines and that way they will captivate their students. The rules are as follows: highlight critical concepts repeatably, provide a visual aid, use logic when possible, use in-class activity, create links between information, stress new vocabulary, treat the students with respect, and hold them to a high standard (Becker and Schneider, 2004). Mike Mulligan emphasizes many of theses points in some aspect, making it an excellent way for a teacher to open a class up and give students a sense of what a construction course will cover.

Course Background

CE3332, Fundamentals of Construction Engineering, is a three credit junior level class required for all Civil Engineering students in CEE at Michigan Tech. It is offered in the fall and spring semesters with approximately 60 students in each class. In addition to the Civil Engineering students taking the class, there are usually some students from other areas such as Mining Engineering, Mechanical Engineering, Electrical Engineering, Chemical Engineering and Business. Many of these students take the class because they are interested in construction, have worked in construction, or plan to work in the industry. There are no prerequisites for the CE3332, but it is a prerequisite for an estimating elective.

As this may be the only construction course that many Civil Engineering students at Michigan Tech take, it was decided that the course should cover a broad range of topics that Civil Engineers would need not only if they worked in construction but for consultants or owners. As a result there are many topics covered that may have a course dedicated to them in larger programs or non-engineering degree programs. These topics include a construction overview, contracts, cash flow, equipment ownership, equipment productivity, estimating, quality and safety. A topic that is covered in more depth is planning and scheduling. Course grading is

based on tests (75%), assignments (15%) and a scheduling project (10%). The textbook in use at the present time is *Construction Management Fundamentals* (Schexnatder and Mayo, 2004) but Construction Management (Halpin and Woodhead, 1995) has been used in the past. There are three lectures per week and no lab. "Mike Mulligan and His Steam Shovel" are read the first day of CE3332 after a brief discussion. The reading takes 25 to 30 minutes. The instructor reads the book while the pictures from the book are displayed.

Mike Mulligan and his Steam Shovel

Virginia Lee Burton, author of "Mike Mulligan and his Steam Shovel", wrote her books based off the inspiration of her two sons. They loved machines and she wrote books that she thought they would enjoy. She took their advice and ideas, and incorporated them into her stories. Burton wrote many other books that were similar to Mike Mulligan, such as Katy and the Big Snow and Maybelle, the Cable Car. These books had very similar concepts as Mike Mulligan, but with different settings (HMC, 2004).

Burton started out as a dancer, but received a job for the Boston Transcript as an artist to sketch about its music, dancers, and theater selections. She admitted that writing her books was the hardest (UOL, April 2004). She worked by trial and error to come up with the best books possible. She would not quit fixing her books until the text and drawings were correct and that her sons reacted positively towards them. She won the Caldecott award for 'The Little House', which was published in 1942 (HMC, 2004).

Burton's book about, "Mike Mulligan and his Steam Shovel," highlights many points of construction topics. All of these topics wrapped up together, combine to make an excellent summary of a construction class. These topics include: different types of construction projects, production and its effectiveness, new technology, need for work, locations of jobs, contracts, safety issues, planning a project, and career change. She stresses some of these topics more than once throughout her work, causing the reader to remember the information better. The book gives an all-around overview of a construction project from beginning to end, and has a happy ending, which is the goal of every project (Burton, 1939).

Points Emphasized

While the intent of the reading Mike Mulligan and his Steam Shovel is to engage the students on the first day, it provides an opportunity to introduce many of the concepts that will be covered in the class. Hopefully, the students can relate to these once that concept is studied. At the time that the concept is covered the instructor reminds the students when that concept was discussed during the reading of Mile Mulligan and his Steam Shovel.

Measuring Production/Estimating

Mike Mulligan continually states throughout the book "…that she (Mary Anne) could dig as much in a day as hundred men could dig in week, but he had never bee quite sure that this was true" (Burton, 1939).

At this point the importance of knowing what the production of a piece of equipment or crew is mentioned and how that is related to estimating the cost of a construction activity. Both of these topics are covered in the class.

Level of Effort

"When people used to stop and watch them, Mike Mulligan and Mary Anne used to dig a little faster and a little better. The more people stopped, the faster and better they dug" (Burton, 1939).

At this point, there is a discussion of human nature and the tendency to work harder when someone is watching. Many of the students can relate to this from their personal experiences. This directly ties into estimating and the fact that in deciding what productivity to use an estimator must be aware of sustained production can be obtained.

Technology

"Then along came the new gasoline shovels and the new electric shovels and the new Diesel motor shovels and took all the jobs away from the steam shovels. Mike Mulligan and Mary Anne were VERY SAD. All the other steam shovels were being sold for junk, or left out in old gravel pits to rust and fall apart. Mike loved Mary Anne. He couldn't do that to her. Everywhere they went the new gas shovels and the new electric shovels and the new Diesel motor shovels had all the jobs. No one wanted Mike Mulligan and Mary Anne any more." (Burton, 1939).

This brings up a brief discussion of technology and keeping current with equipment and technology. A short discussion arises on changes that have occurred in technology and how they have improved productivity or made tasks easier. The use of new technology is necessary for contractors to remain competitive. The discussion concludes with the "love" that Mike Mulligan had for Mary Anne. This is how some contractors feel about equipment that they own. They have a hard time replacing it. Again, many students are aware of this through their own experiences.

Desperate for Work

"Everywhere they went the new gas shovels and the new electric shovels and the new Diesel motor shovels had all the jobs. No one wanted Mike Mulligan and Mary Anne any more. Then one day Mike read in a newspaper that the town of Poppperville was going to build a new town hall. 'We are going to dig the cellar of that town hall' said Mike to Mary Anne and off they started. They left the canals and the railroads and the highways and the airports and the big cities where no one wanted them any more and went away out in the country." (Burton, 1939).

The concept of what makes contractors desperate for work is discussed at this time. In Mike Mulligan's case, it is the inability to get any work in location that he currently resides. He is willing to go into a different region, where he has not worked, in order to get work. Mike's

emphatically states, “We are going to dig the cellar of that town hall”. The discussion of the extremes that contractors will go to in order to get work in further illustrated in the next section.

Contracts

“Mike Mulligan spoke to Henry B. Swap, one of the selectmen. ‘I heard,’ he said, ‘that you are going to build a new town hall. Mary Anne and I will dig the cellar in just one day.’ ‘What! Said Henry B. Swap. ‘Dig a cellar in a day! It would take a hundred men at least a week to dig the cellar for our new town hall.’ ‘Sure,’ said Mike, ‘but Mary Anne can dig as much in a day as a hundred men can dig in a week.’ Though he had never been quite sure that this was true. Then he added, ‘If we can’t do it, you won’t have to pay. Henry B. Swap though that this would be an easy way to get part of the cellar dug for nothing, so he smiled in rather a mean way and gave the job digging the cellar of the new town hall to Mike Mulligan and Mary Anne.” (Burton, 1939).

At this point the extreme desperation of Mike Mulligan is evident and his lack of knowledge of Mary Anne’s actual production rate further compounds the problem. He agrees to do work for nothing if he cannot meet the schedule that he proposes. At this point the instructor asks the question as to what else is wrong. Usually, a student will respond that there is no written contract that spells out the conditions. While the verbal contract may be legal, it is dangerous for contractors to enter, if the parties have different interpretations of what was agreed upon.

Safety

“The smoke and steam cleared away, and there was the cellar all finished. Four corners…neat and square… four walls straight down, and Mike Mulligan and Mary Anne at the bottom, and the sun was just going down behind the hill” (Burton, 1939).

With the picture from the book displayed in class the students are asked if there is anything that concerns them. Usually, there are some students who have had excavation safety training and three items are mentioned which are against OSHA regulations. First, the walls are straight down instead of sloped. Second, the excavated material is too near the edge of the excavation. It must be three feet from the edge. Last, there is no means of egress (i.e. a ladder) for Mike Mulligan to get out of the excavation. This not only helps students with previous safety training review, but gives other students an idea of what different safety hazards are out there and what they need to look for when out on the site.

Planning

“Mike Mulligan looked around at the four square walls and four square corners and he said, ‘We’ve dug so fast and we’ve dug so well that we’ve quite forgotten to leave a way out!’ Nothing like this had ever happened to Mike Mulligan and Mary Anne before, and they didn’t know what to do.” (Burton, 1939).

Mike Mulligan had not properly prepared the project as he was desperate for work and did not do the required pre-project planning that is necessary to identify potential problems. He was only focused on getting the job done. The lack of contract defining the scope of the work comes

backs to haunt him at this time when Henry B. Swap states, 'The job isn't finished because Mary Anne isn't out of the cellar, so Mile Mullligan won't get paid" (Burton, 1939).

Career Change

"Now the little boy, who had been keeping very quiet, had another idea. He said, 'Why couldn't we leave Mary Anne in the cellar and build the new town hall above her? Let her be the furnace for the new town hall and let Mike Mulligan be the janitor" (Burton, 1939).

At this point the class discussion revolves around the importance of contractors to take into consideration the factors that have been discussed previously. If they do not, they may not be as lucky as Mike Mulligan in finding a new career.

Summary

The reading of Mike Mulligan and His Steam Shovel demonstrate many important concepts, students need to realize and learn about in order to become construction professionals. This technique of reading the book in the first day of class draws students in by relaxing them, giving them a sense of what the class will cover, and an idea of the teacher is like. Hopefully, this will motivate the students to have an interest in the class, but help them to become more relaxed and participate in class discussions and activities. The book ties many aspects of a construction project together.

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