

## **What's So Funny About STEM: Examining the Implementation of Humor in the Classroom**

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# **What's So Funny About STEM:**

## **Examining the Implementation of Humor in the Classroom**

### **Introduction**

Humor has long held a place in the repertoire of classroom instructors and researchers have examined the role of humor in the classroom for over four decades across many contexts. Recently that research has focused on the use of humor in the college classroom, primarily focusing on students' perception of humor use and not on the manner in which the instructors were employing it (Torok, McMorris, & Lin, 2004). However, student perceptions of humor give relatively no indication to the intent of the humor or to the immediate effect of it on the classroom (Ocon, 2015). Humor can serve as a powerful tool to maintain student engagement, to break up lengthy lectures on technical topics, and to serve as a platform for building student-instructor rapport (Neumann, Hood, & Neumann, 2009). However, without empirical understanding of how humor's use affects the classroom, instructors are often hesitant to employ it. Therefore, through classroom observations, this study examines faculty use of humor in order to characterize that humor and examine its relationship to student engagement and the usage of teaching techniques.

### *Research Questions*

1. How do STEM faculty implement humor in a standard class session?
2. What is the difference between student engagement in classes that employ humor and those that do not?
3. What differences (with respect to other teaching techniques) exist between the classes that use humor and those that do not?

### **Humor in the Classroom**

Humor has long been included in the repertoire of instructors at a variety of educational levels. At the elementary and secondary school level, humor has been shown to be a valuable tool for establishing communication skills and sociocultural understanding while providing instruction on the subject matter across course contexts (Garner, 2006). Research at the collegiate level has primarily concentrated on student perceptions (i.e. how the students view the instructor's use of humor) (Ocon, 2015; Neumann, Hood, & Neumann, 2009).

Overall, students perceive humor to be an effective teaching tool (Ocon, 2015). When surveyed, undergraduate students in an engineering class at Purdue University, Calumet, consistently agreed that "I am more likely to remember class material if it is presented with humor" or "The use of humor makes classes more fun or interesting" (Ocon, 2015). Garner (2006) supports this same claim when studying students in a collegiate distance learning class format. After reviewing an asynchronous video of a recorded class, the students exposed to humor had statistically higher ratings for the overall opinion of the lesson, how well the lesson communicated the information, and overall rating of the professor. In addition, participants in this study who were exposed to the humor lecture had statistically higher recall and retention of the course information. Furthermore, Neumann, Hood, and Neumann (2009) identified a positive

correlation between humor use and students' rating of the effectiveness of the communication. The difficulty with this research is that it is based on upon student impressions and is not directly linked to other classroom practices. Without a clear benefit, humor can be perceived as only taking up class time that could be spent covering course content. However, when used appropriately, content-specific humor can provide students with new perspectives and insight on the course material (Ziv, 1983; Garner, 2006).

### *Students*

Many different types of humor exist within the classroom, each with varying degrees of effectiveness, time use, and ease of employment. Torok, McMorris, and Lin (2004) classified humor use into several categories, including funny stories, jokes, puns, sarcasm, sexual humor, and hostile humor. The study asked students which types of humor they would recommend for use in the classroom; students most recommended funny stories, funny comments, and professional humor; while ethnic and hostile humor were discouraged (Torok, McMorris, & Lin, 2004). Students are more comfortable with the use of stories and comments than hostile humor.

While these overall trends show humor to be a favorable practice, they fail to account for the short-term effects of humor's use that can be achieved by examining individual uses and categorizations of humor. Bryant, Comisky, and Dolf (1979) sought to categorize the intent of the instructor in using humor in the classroom. Their study identified several characteristics of both the instructor and the case of humor; they concluded that male instructors were more likely to use stories, while female instructors preferred funny comments. The study also showed that the majority of the humor was related to the educational message and that it is often not distracting. Furthermore, male instructors were more likely than female instructors to involve themselves in the humor, although this was attributed to a tendency of male instructors to use self-disparaging humor (Bryant, Comisky, & Dolf, 1979). Utilizing their categorizations can provide insight into humor's use in the STEM classroom and the effects thereof.

### **Methods**

This study utilizes an exploratory mixed methods design that incorporates quantitative analysis of instructor behaviors in the classroom with qualitative excerpts of faculty comments. The data utilized in this paper was collected as part of a larger study examining the use of evidence-based instructional practices in foundational STEM courses.

### *Participants*

Participants for this study included 48 STEM instructors from a first-year engineering curriculum in a College of Engineering, Physical Sciences, and Mathematics curriculum in a College of Arts and Sciences at a medium-size, private institution. The participants represented both male (69 %) and female (31 %) faculty across tenure statuses ranging from non-tenured faculty to tenured-tracked and tenured faculty. Participants of various academic ranks were included: adjunct faculty and instructors, assistant and associate instructors, in addition to full faculty. As summary of these participants can be found in Table 1.

Gender	
<i>Male</i>	69 %
<i>Female</i>	31 %
Tenure Status	
<i>Non-Tenured</i>	55 %
<i>Tenure Track</i>	16 %
<i>Tenured</i>	29 %
College	
<i>College of Engineering</i>	40 %
<i>College of Arts and Sciences</i>	60 %
Department	
<i>Engineering Science</i>	13 %
<i>Engineering Fundamentals</i>	25 %
<i>Mathematics</i>	31 %
<i>Physical Sciences</i>	31 %
Rank	
<i>Associate</i>	29 %
<i>Assistant</i>	31 %
<i>Adjunct</i>	21%
<i>Instructor</i>	9 %
<i>Full</i>	10 %

Table 1: Instructor Demographics (N = 48)

### *Data Collection*

The primary source of data for this paper utilized a single, video-recorded, classroom sessions for each of the participants, sessions occurred throughout an academic year. Instructors were asked to select a standard class session during which the recording would be conducted, and therefore, knew in advance that they would be filmed. The video camera was set up before the class started and no additional instructor was present to monitor the device during the class to prevent further bias due to obtrusiveness. Class length varied between 50 minutes and 2 hours.

### *Data Analysis*

Once collected, the video was coded in one-minute increments for instances of instruction, dialogue, instructional technology, pedagogical strategies, student cognitive engagement using the Teaching Dimensions Observation Protocol (TDOP) (Hora & Ferrare, 2014). The codes are summarized in Table 2. Each video was coded by two separate people. The results were compared and discrepancies in the coding were resolved for instances with less than an 80% overlap using negotiated agreement.

<b>Teaching Methods</b>	
<i>Teacher-focused Instruction</i>	Lecturing
	Lecturing while Writing
	Lecturing from Premade Visuals
	Lecturing with Demonstration of Phenomena
	Socratic Lecture
	Working Out Problems
	Individualized Instruction
	Multimedia
	Assessment
	Administrative Task
<i>Student-focused Instruction</i>	Small Group Work / Discussion
	Deskwork
	Student Presentation
<b>Student-Teacher Dialogue</b>	
<i>Teacher-led Dialogue</i>	Instructor Rhetorical Question
	Instructor Display Question
	Instructor Comprehension Question
<i>Student-led Dialogue</i>	Student Question
	Student Response to Teacher Question
	Peer Interactions
<b>Pedagogical Strategies</b>	<b>Student Cognitive Engagement</b>
Humor	Making Connection to Own Lives / Specific Cases
Anecdote / Example	Problem Solving
Organization	Creating
Emphasis	

Table 2: Teaching Dimensions Observation Protocol, compiled from Hora & Ferrare (2014)

Using TDOP, instances of humor were identified in many of these classes. It is also possible that cases exist where an instructor said something meant to be humorous, but the class did not respond as such. As cases like this are difficult to identify, a more obvious identification method was based on class response, usually laughter, to what the instructor or a student had said. Each case of humor use was defined as an event; to obtain the content and intent of each of these events, a transcription of the dialogue and a description of the context were established for each one. TDOP was especially useful for this approach because it allowed many different dimensions of pedagogy to be observed and noted, allowing for the effects of humor to be analyzed with respect to a wide variety of other practices. Subsequent quantitative statistical analysis of the coded observations included descriptive statistics and non-parametric comparison of individual samples; comparing TDOP items associated with student engagement and teaching approaches between faculty that used and did not use humor in the recorded video session.

The qualitative assessment of the humor presentation method modeled the classification employed by Bryant, Comisky, and Zillmann (1979). Each case of humor was categorized according to the definitions in Table 3.

Joke	a relatively short prose build-up followed by a punch line
Riddle	a message presented in the form of an information question with the answer provided in a humorous punchline
Funny Story	the instructor related a series of connecting events or the activities of a single event as a tale
Humorous Comment	brief statement with a humorous element
Other	A humor usage that does not fall into any of the aforementioned categories

Table 3: Humor Presentation Method Definitions, compiled from Bryant, Comisky, and Zillmann, (1979)

Humorous events were also defined according to their relevancy to the class topic and to what degree they were related, following the scheme used by Bryan, Comisky, and Zillmann (1979). Events were classified as either distracting from the educational point, neither distracting nor contributing to the educational point, or contributing to the educational point. Similarly, events were also rated “not at all related,” “moderately related,” or “extremely related” to the material being covered during class.

To account for the content of the humorous event, character involvement and use of disparagements were noted for each. Each event was classified as “student involved,” “instructor involved,” “both instructor and student,” “other character involved,” or “no character involved” in the humor content. Disparagement was attributed to the student, the instructor, another non-present character, or as not present.

The perceived timing of the humorous event was also classified as either spontaneous, predetermined, or indeterminate. Humor that was part of the planned class material was classified as predetermined, while events that occurred due to student interactions or class discussion were considered spontaneous.

## Findings

Throughout the videos, 42 separate cases of humor use were identified in 18 different classes; no humorous events were identified in the other 30 videos. 63% of the observed instructors used no humor, while 21% used a single case, 10% used 2 to 5 cases, and 6% used greater than 6 cases during the recorded class.

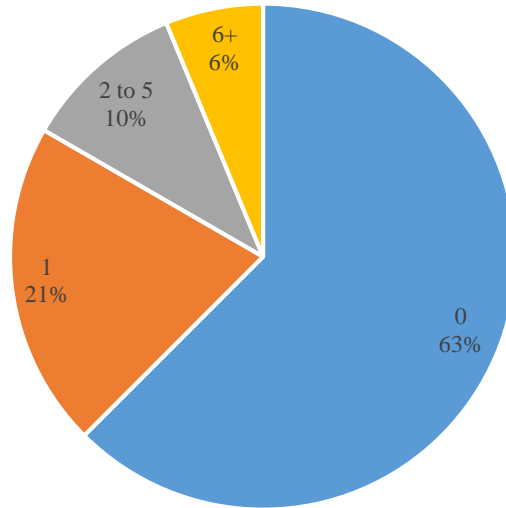
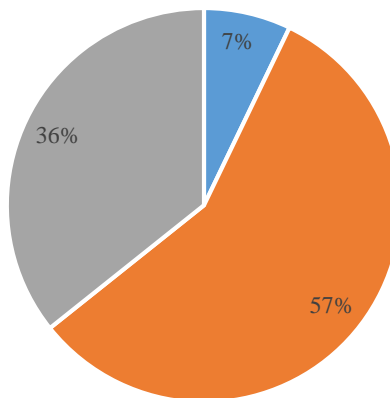


Figure 1: Frequency of Humor Usage by Instructor

*Occurrence and timing of humor*

Humorous events initiated by students, or humor that was catalyzed by the classroom situation, were considered to be spontaneous; events of this type were more common than predetermined uses of humor. Although, the timing of the humor could not be determined for over one third of the cases.



■ Predetermined ■ Spontaneous ■ Indeterminate

Figure 2: Perceived Timing of Humorous Events

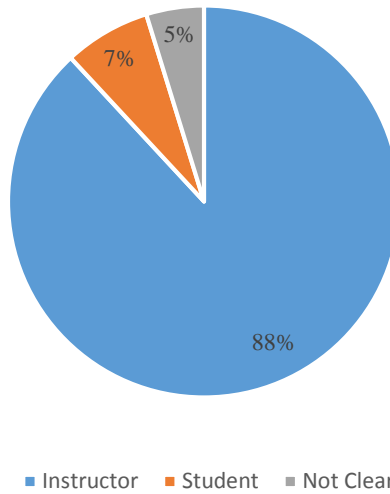


Figure 3: Initiators of Humorous Events

By noting the temporal location of each humorous event, trends in three main categories (only use, first use and subsequent uses for instructors who use humor more than once) are visible. Humor trends were analyzed by minute and by percentage of class to observe trends based on both physical time and after a given portion of the class had passed. Nearly all the first events in classes where humor was used multiple times happened prior to 25 minutes into the class session; subsequent events in these classes were spread out over the next 40 minutes. Classes in which the instructor employed humor only once did not display any clear trends; however, this could be due to the small sample size of classes. As can be seen in Figure 5, there is a cluster of humor use at the beginning of the class, mostly from instructors who employ humor multiple times throughout the class. There is also a rise in humor use from the 50% to 70% marks.



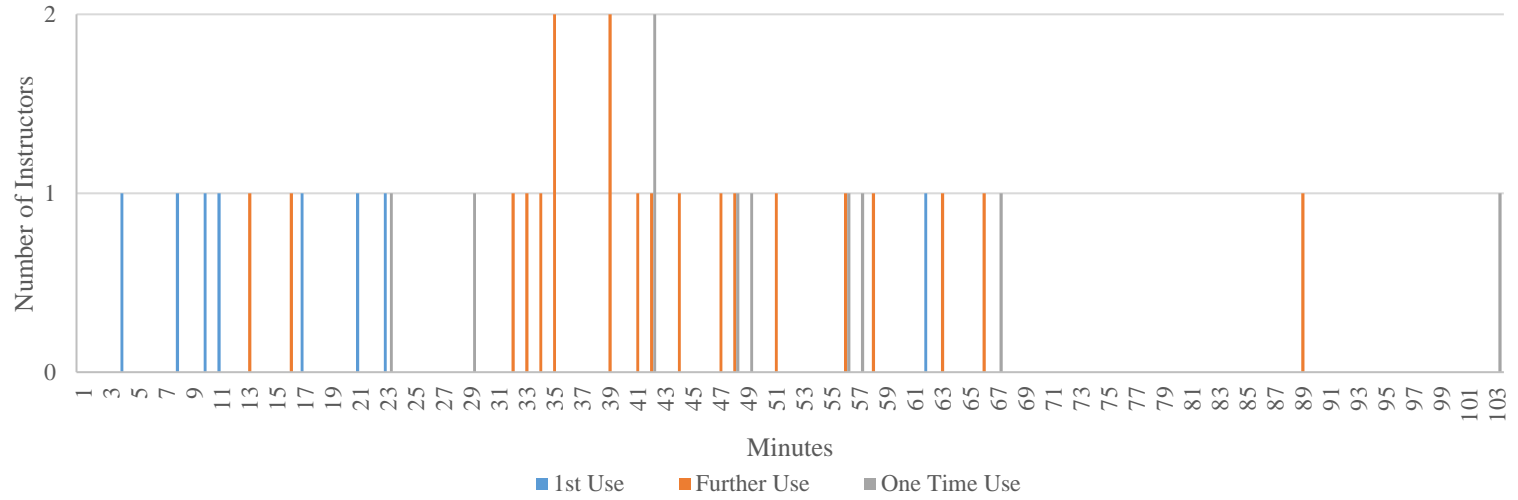


Figure 4: Temporal Location of Humor Use with Respect to Minute of Class Elapsed

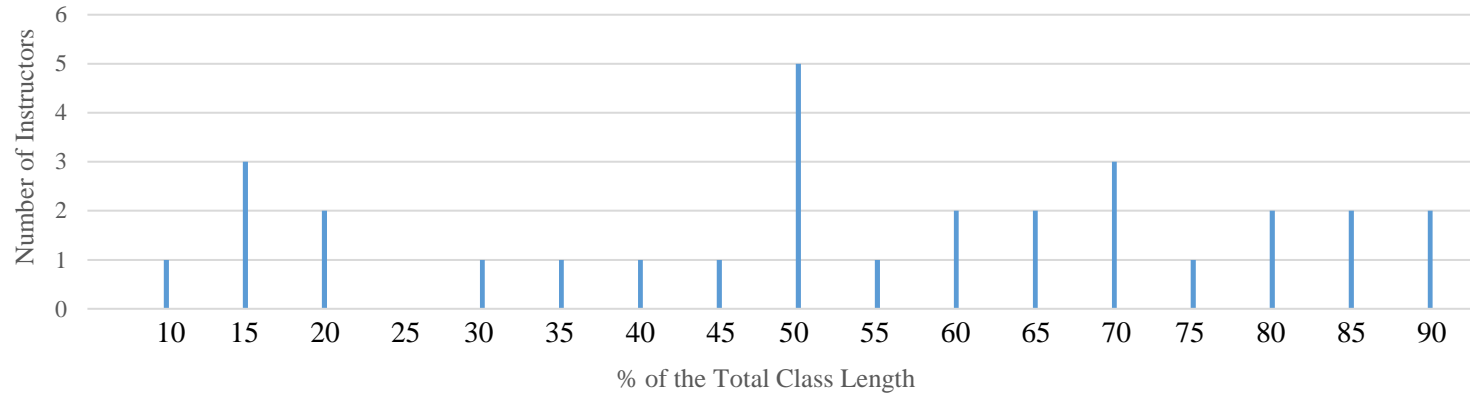


Figure 5: Temporal Location of Humor Use with Respect to Percentage of Class Elapsed

### *How humor was included in the class session*

Presentation methods vary across disciplines and instructors; for the observed classes, humorous comments were much more common than any of the other methods, comprising nearly three fourths of the humor used in these classes. Humorous comment typically last only a few seconds, such as one professor saying “We apparently value your education more than the National Arbor Day Foundation’s priorities,” when asking a student to print a lengthy assignment to be turned in. Despite the short amount of time spent, these comments often help to regain the attention of students whose minds have wandered. They also can serve to provide a brief break in the delivery of technical material being taught. One instructor said, “Keep writing, keep writing!” after a student pointed out an error in a calculation that needed to be corrected; the instructor took the error and used it as an opportunity to reengage the class using humor.

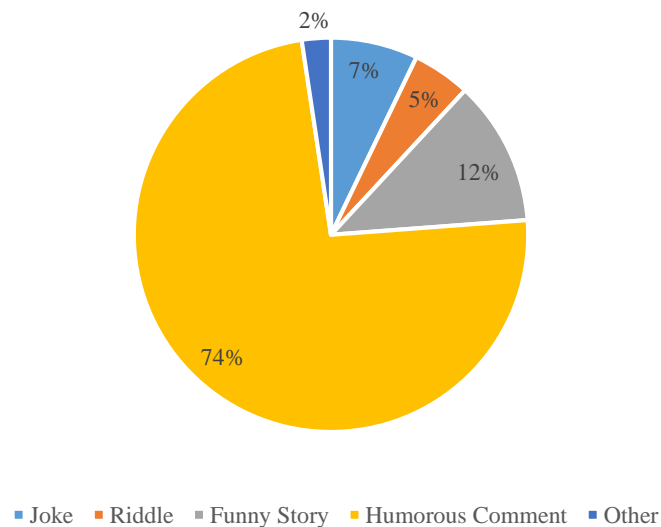


Figure 6: Humor Presentation Methods

Funny stories were the next prevalent form of humor with five of the 42 humorous events presented this way. One instructor told a story about visiting his grandparent’s house and drinking tea by pouring the tea into the saucer. When he asks the class why they did this, a student responds by saying that it cools the tea faster. The instructor responds, “that’s what I’ve been trying to explain for the last 3 minutes!” which was met with laughter. He then said, “bigger surface area means easier to transfer energy, right? Even my grandfather knew that and used it in a practical way.” This was also met with laughter from the class. Funny stories typically lasted longer than any of the other methods and were either moderately or extremely related to the educational material, justifying the time spent.

Other funny stories served as reminders of general classroom management and educational propositions to help students succeed. An example of this was seen in the case where an instructor told a story about a student providing a false name on an assignment to avoid being

blamed for not performing well on the activity. This served to remind students to include their names on their assignments, without literally saying, “Don’t forget to write your name on your paper.”

Statements, such as “If you are completely lost, of course, you know what to do: leave class,” typify instructors’ use of jokes. Comments such as this are not meant to be serious, but rather to instill humor into what might otherwise be an unengaging administrative task or item to be taught.

Riddles employ intellectual humor and are often connected to the material being taught. One Physics instructor presented this riddle: “Even when you don’t have weight, do you still have mass? So you can lose your weight, but you still have mass. That’s why they have diets, to lose weight, not mass.” Humor utilized in this manner allows for educational points to be made in a memorable way.

Some humorous events were related to the educational material, while others were a product of the classroom environment. As shown in Figure 7, half of the humor events were not related to the course material, and less than 15% were extremely related to the educational material. The funny story mentioned above is an example of humor that is extremely related to the educational material, as the humor was used to make an educational point. Humor that is moderately related is typified by statements like “in the United States, again, very special country, we [use] sometimes pounds;” while this statement is related to the educational material, the humor is not being used to illustrate any part of the lesson. Unrelated humor is often a product of the classroom situation, such as an instructor saying, “This is my stage; there should be a star right here!” after a student walked in front of him to get to his seat.

However, as shown in Figure 7, despite the content of the humor often being unrelated, the humor itself did not cause a consistent distraction. Three-fourths of the humor events coded were neither distracting, nor contributed to the educational material; humor employed in this way reengages the class without the intent of contributing to the educational content. A slim 14% contributed to the material, most of which seemed to be pre-planned cases meant to enhance the class’s understanding. The funny story mentioned earlier is an example of humor meant to contribute to the educational material.

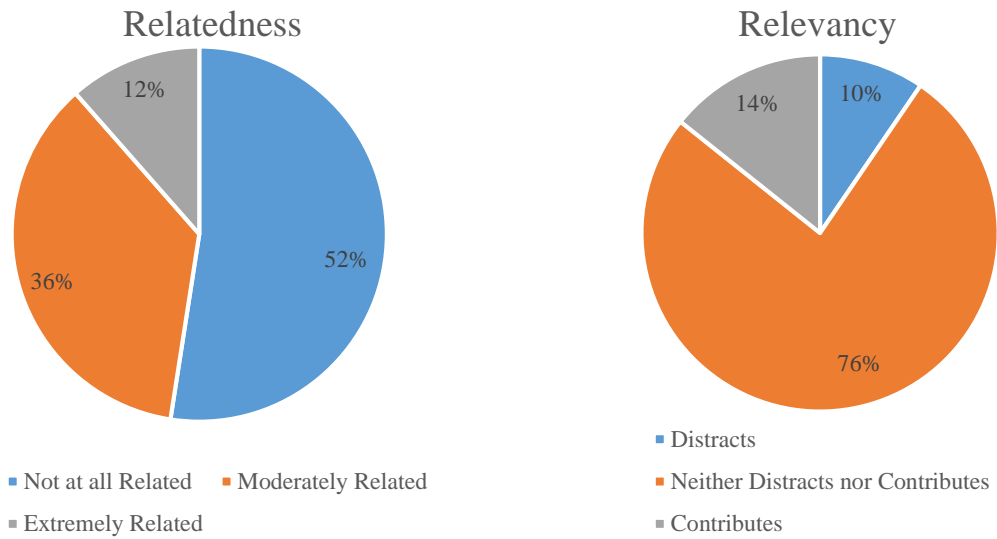


Figure 7: Relatedness to Educational Material and Relevancy of Humorous Events

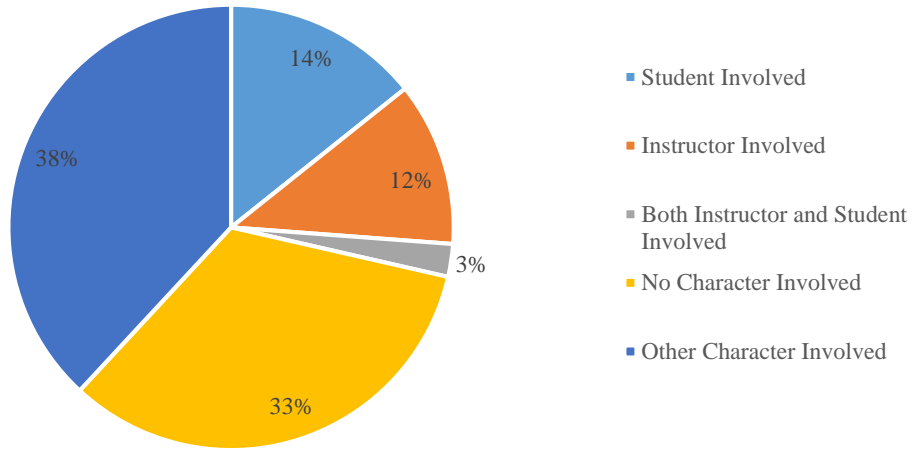


Figure 8: Character Involvement in the Humor Material

The majority of the humor observed from these classes either didn't involve a character or involved a character or characters who were not present (i.e. not the instructor or the students). A comment such as "Oh! Oh no! I don't like that! No!" from an instructor who has obtained an incorrect answer involves no character, while an instructor describing a movie in which Nazi supporters plotted to clone Hitler involves a character who is not present. An instructor saying "Oops, uh oh ... that's trouble," when he dropped a marker into the cavity behind a white board, directly involves the instructor. Of the cases that did involve a present character, 6 involved only a student, 5 involved only an instructor, and 1 case involved both a student and an instructor.

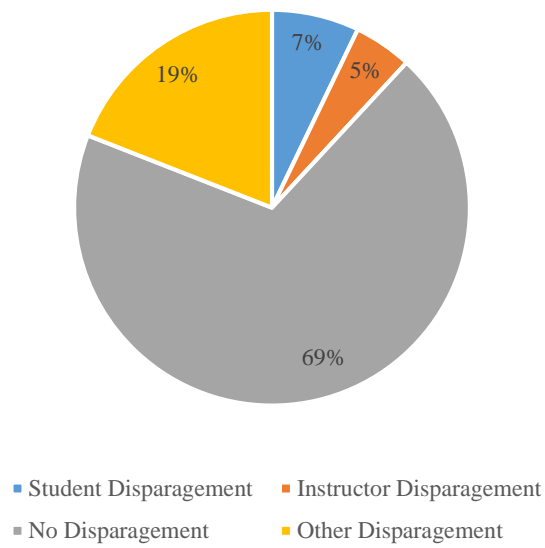


Figure 9: Presence of Disparagement in Humorous Events

The majority of the humorous events observed included no disparagement. 8 cases of disparagement were aimed at a character outside the classroom, two were about the instructor, and 3 were about a student or students in the class. In a previously mentioned comment, the instructor disparages at the university by saying, “We apparently value your education more than the National Arbor Day Foundation’s priorities;” this is an example of disparagement aimed outside the classroom. Conversely, the instructor involved in the next example employs humor aimed at a student within the classroom. During the class, the instructor said, “I should find you a new chair” to one of the students. When the student inquired as to why, the instructor replied, simply, “Talking.” This was met with laughter from the entire class. Humor of this kind serves to make a point without being overly critical of the student and to identify a behavior that requires correcting.

#### *Student Engagement (Classroom Effect)*

The percentage of the class minutes containing student questions was statistically higher in classes that used humor than in classes that did not contain humor ( $p < .05$ ) = 0.025). The average percentage for classes without humor was 11.5 %, while the average for classes with humor was 18.4 %. When humor is used, it reengages students who have become distracted; this change also brings with it an increase in student questions.

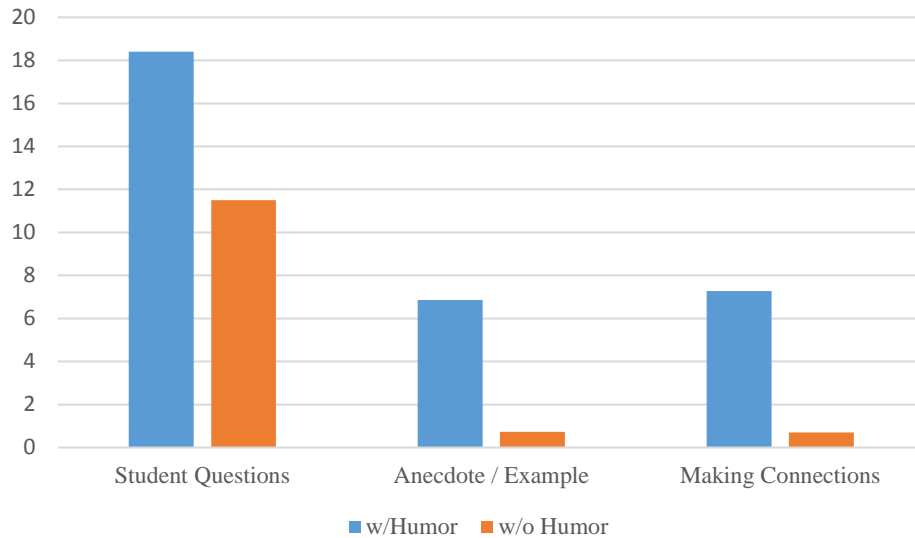


Figure 10: Average Percentage of Class Using Student Engagement

The use of anecdotes, examples, and connections to specific cases or student lives is more statistically significant in classes that also contain humor ( $p = 0.000$ ). The average percentage of the classes in which anecdotes or examples are used in classes without humor is a mere 0.7 %, compared to 6.9 % in classes with humor. Similarly, the percentage of the classes where connections are made is 0.7 % without humor and 7.3% with humor. More often than not, anecdotes and connections are made in a humorous context to make them memorable. One instructor equated the Coriolis Effect to the feeling of walking on a Merry-Go-Round or being drunk; this presentation of class material with humor is more memorable than talking about how a toilet flushing resembles the same phenomena. While increased student engagement is evident through student questions, no statistically significant difference with, versus without, humor was shown for any other teaching techniques.

## Conclusions

Fewer than half of STEM instructors used humor in the classroom, and the majority of those that did only used humor once per class. Humor can be an effective engagement tool. Its use, however, draws time away from the main educational message, requiring instructors who use humor frequently to be more efficient during the rest of the class. From the timing of the humor throughout the class session, we can observe that humor is being used to engage or reengage students as their attention fades with time. Some humorous events are pre-planned for this purpose or to illustrate parts of the educational material. Conversely, some instructors utilize student speech, student action, or the classroom environment as a platform for spontaneous humor. This method, while effective at increasing student engagement, seldom contributes to the educational point; therefore, this type of humor is usually limited to a few seconds of class time.

In the same vein of saving time, instructors are more likely to use humorous comments, which can occupy only a few seconds, compared to other types of humor. Presentation methods, such as funny stories, which can take a minute or more to use, are often reserved for illustrating educational material, which justifies the time spent. All the presentation methods, serve to

increase student engagement, while some cases of humor also serve to communicate either educational or administrative ideas as well.

Half of the humor employed in the classroom is not related to the educational material; however, this unrelated material rarely distracts from the educational message. Extremely related humor is often planned as part of the lesson to illustrate a particularly confusing topic. The majority of the humor in the classroom neither distracts nor contributes to the educational material; it mainly serves as an engagement tool.

Character involvement in the humor can serve several purposes. In the case of disparagement, humor aimed at a student can serve as a light reprimand, humor aimed at a non-present character can add to shared student-instructor experience, while humor the instructor aims at himself can serve to improve student-instructor rapport. Despite its usefulness, disparagement humor is not common, likely due to the risk of harshness that comes with it. Two-thirds of the humor involves a character, the majority of which involves a non-present character. Humor about non-present characters allows for more severe humor, but runs a lower risk of offense than humor about a student, making it a more appealing option for instructors not wishing to poke fun at themselves.

While it is known that humor usage increases student engagement, measuring this on a minute-to-minute basis presents something of a challenge. However, student questions are an excellent indicator of classroom involvement. Students are more likely to ask questions in classes that employ humor, compared to classes that do not. Additionally, instructors employing humor are more likely to make connections to student's lives and to use anecdotes, both of which also increase student engagement. Student questions also facilitate inquisitive learning, further indicating that humor effectively increases engagement.

Humor's usefulness in the classroom, both as a tool for making educational material memorable and as an engagement device, is sure. Pre-determined humor can be used to fill foreseen holes, while spontaneous humor can serve to build student-instructor rapport. Lengthy uses of humor should be reserved for educational material, in the interest of ensuring all content for a given class is covered. Further research into student reactions to individual cases of humor would serve to develop a better understanding of which types of humor are the most effective, allowing instructors to make informed decisions about their use of humor on a day-to-day basis.

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