

INTRODUCING CREATIVITY AND ARTISTIC EXPRESSION INTO ENGINEERING TECHNOLOGY COURSES

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ABSTRACT

An extra credit assignment is offered to students in Civil and Construction Engineering Technology classes at IPFW (Indiana University Purdue University Ft. Wayne). The intent of this assignment is to motivate students to engage in the subject matter. Students are asked to develop a creative or artistic expression (CAEX) of the subject matter. The instructor models examples of these creative and artistic expressions before selected classes over the semester. In doing this, the instructor does things such as playing songs, showing photographs, making a collage, or writing other lyrics to a song. Students submit a typed document that explains how the CAEX relates to the subject matter to complete the extra credit assignment.

The idea for this assignment developed from the author's involvement in the ExCEED program. ExCEED is the teaching workshop sponsored by the American Society of Civil Engineers. The motivation for the assignment was bolstered by student evaluations of the author that indicated the author "needed to lighten up" in class. In general, students enjoy this lighter side of class and many comment that the images allow them to connect the subject matter with the real world and the songs help make an impression of the subject matter. The response from students completing the extra credit assignment is substantially less enthusiastic than anticipated. Few students have actually taken the opportunity to earn this extra credit by engaging in the simplest artistic or creative endeavours. There seems to be little correlation between the efforts done to model actions for the students and students participating in the assignment. Making the assignment formal just like any other assignment and not "extra credit" is being considered. The project, and the resulting paper, is a work in progress.

1. BACKGROUND

Creation of the CAEX assignment can be attributed to multiple sources. The primary source that built the foundation for CAEX was participation in the ExCEED Teaching Workshop. The stimulus for actually making CAEX an assignment followed a formative assessment session conducted by another faculty member. There are instances of assignments intended to generate student interest by other faculty members.

1.1 Foundation

The author was selected as an ExCEED Fellow in 2003. ExCEED is an acronym for Excellence in Civil Engineering Education and the ExCEED Teaching Workshop (ETW) is sponsored by the American Society of Civil Engineers. ETW is characterized by very active, high energy, classroom atmosphere (Estes and Ressler, 2001). Classroom activities modelled at ETW included use of video and still picture graphics, music, physical actions, and classroom props & objects. These activities created a classroom environment that kept attention and interest. Furthermore, these activities were fun.

1.2 Incentive

The author is relatively new to the academic profession. In order to learn how to teach as well as improve teaching ability, multiple measures of assessment have been employed to determine how to become more effective. Student comments are regularly solicited. In the Fall 2003 semester, a concerted effort was made to solicit student feedback which included an in-depth discussion period with a faculty member who specializes in group dynamics from the School of Organization and Leadership Supervision. This was done during a portion of a lab session class comprising of about 30 minutes. One of the many findings that resulted from this effort was that students were not comfortable in class much due to the disposition of the instructor. End of the semester student evaluations echoed this sentiment with repeated comments of “lighten-up or relax” to the question “how can the instructor improve.”

Learning styles may be different between the instructor and many students in class as well as among a class of students. There is strong evidence that learning styles and teaching methods create disconnects between an instructor and students (Wankat and Oreovicz 1993). The author recognized that many students in class were pursuing degrees in architectural engineering technology. Arguably, this degree program attracts students who are by nature more creative and artistic in terms of drawings, schematics, and other visual means. However, the author is decidedly not that type of person and fits well with stereotypes of engineers. This is evidence of a disconnection between the instructor and the many of the students.

1.3 A novel & fun class assignment

A case of a novel and fun class assignment is presented by Ressler and Hanus (2004). Students watch the movie “Monty Python and the Holy Grail” then perform an engineering analysis based on a scene in the movie. The assignment is completed with a report of student work. Ressler and Hanus (2004) indicate that the assignment is evidence of “successful transfer of learning” as well as an activity where students demonstrated “considerable enthusiasm.”

2. THE ASSIGNMENT

The CAEX assignment is formally made by means of an assignment sheet handed out at the beginning of the semester. An example of the assignment sheet is included as Appendix A. The assignment offers extra credit to the student for engaging in some type of creative or artistic

expression in terms of the subject matter. The extra credit reward is up to a maximum of 1% at the end of the semester grade calculation. The extra credit assignment is limited to three attempts. The actual sheet for the extra credit assignment is termed “Extra Credit Tender”. The term tender is used since this offer is made in classes which are all part of a department engaged in various aspects of the construction industry. The word tender is common in other countries to mean offer or construction bid. Thus, the very wording of the assignment attempts to get students to think about foreign lands and languages if in the slightest bit. Furthermore, the author models how the extra credit assignment can be completed before several classes during the semester. Examples of this are at the beginning of a construction economic analysis class playing songs like “Money, That’s What I Want” from the Animal House soundtrack or “Money” by Pink Floyd. Additionally, for the topics of torsion and angle of twist in structural analysis classes Chubby Checker’s “The Twist”, the Beatles singing “Twist and Shout” on Ed Sullivan, or even the same song from “Ferris Beuller’s Day Off” can be played.

3. REACTION AND ASSESSMENT

Student response is characterized in three manners. These manners are student reaction receiving the assignment, students partaking in the assignment, and student comments on evaluation forms at the end of the semester.

3.1. Assignment receipt reaction

In general, student reaction is quite positive when the assignment sheet is passed out. Evidence for this is somewhat anecdotal. Student comments in the room are positive due to students talking about the assignment, what it means, what could they do, and just happy about the opportunity to earn extra credit. Students have routinely asked multiple questions simply upon receiving the assignment sheet. This is gauged as a positive response. Upon making the assignment for the first time, one student queried about what the words “other examples of creative and artistic expression are possible” might mean, and particularly if dance was an option. This created a good laugh in class. Obviously, in listing examples of drawings, music, etc. dance was absent from the assignment sheet but certainly was a possible manner to express the subject matter.

3.2. Student response to assignment

The number of students completing this offer for extra credit has been quite low. In 3 semesters, and 9 different classes composed of over 100 students in total, only 4 students have responded with any creative or artistic expression responses to the offer. All of these responses have been in classes dealing with structural analysis topics. Two of these 4 responses were minimal attempts in the instructor’s opinion and one response was a bit staged. Two students have submitted lyrics of a song and the text of a poem, both of which has some words related to strong buildings, but neither were original works of the students. In one instance, the song lyrics contained a vulgarity and it is thought that the student was “pushing” to see if the instructor would accept the extra credit or even be tempted to play the song in class. These responses were

disappointing and did not meet the expectation of the assignment as originally intended. The nearly staged response was a “dance” performed by a student.

In an effort to garner student attention and reinforce the circle aspect of Mohr’s Circle, the author took a hula-hoop to class. There was an expectation that either the students would attempt to compel the instructor to “dance” the hula-hoop or that some student would offer to do so. One student did rise to the occasion after a bit of urging from classmates. This was not really creative on the part of the student but did illustrate initiative and interest in class.

The extra credit offered to all of these students who participated in the CAEX was an additional 1% added to the final grade calculation although their efforts did not meet the original expectations of the assignment. However, in all of these cases, this additional 1% to the final grade did not impact the letter grade earned by the student. The fourth student to complete this assignment also earned an additional 1% to the final grade and this student was well aware that in all likelihood, a final grade of A was assured for the class at the time the assignment was completed. Nevertheless, the creative and artistic expression by this student was considered outstanding. It truly met the original expectation of the assignment.

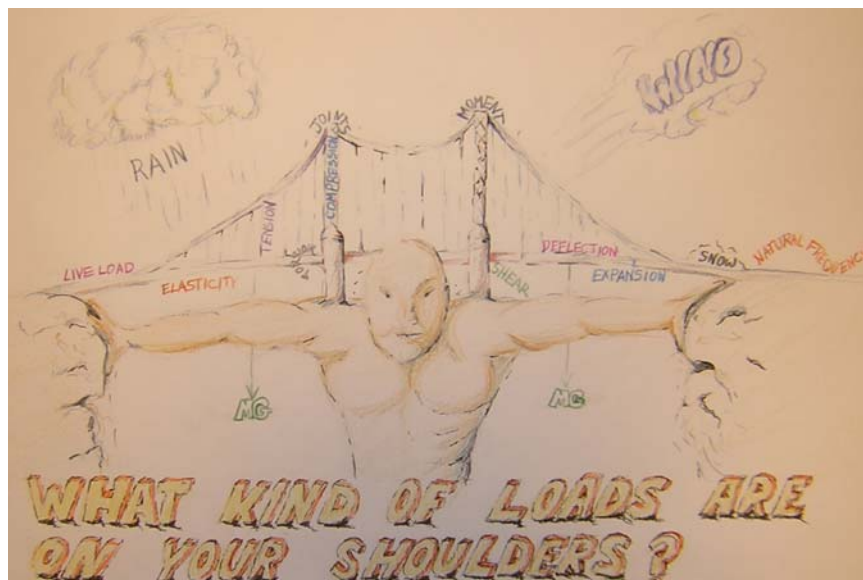


Figure 1: Student graphic.

The fourth student drew a graphic of a cable suspension bridge, imposed on the shoulders of a “muscle-man” while inserting text and symbols that related to the subject of structural analysis through-out the drawing. Large text at the bottom of the graphic asks “what kind of loads are on your shoulders?” An image of this student’s effort is shown as Figure 1.

This graphic is included with the permission of the student who elected to remain un-named.

3.3. Student Evaluation Assessment

End of the semester evaluation forms offer a third means of assessing this extra credit tender. The author employs a specific instructor evaluation form (Devine, 2005) to gather student

feedback of various class activities and instructor actions. Specific questions related to CAEX included in this evaluation and the student responses are illustrated in Table 1.

Table 1: Student Evaluation Response.

Question	Yes	No
Do you remember the Extra Credit Tender?	87%	13%
Did the Extra Credit Tender interest you?	25%	75%
Did you submit anything for the Extra Credit Tender?	2%	98%

These responses clearly indicate that while students overwhelmingly report being aware of the extra credit offer, they do not want to participate. The evaluation form queried the student to respond how/why/why not to the second and third questions. Student responses are characterized by claims of not having enough time and not having the abilities needed to complete any creative or artistic effort. Some students commented that there was not enough extra credit offered in the assignment.

Note that additional data from the previous semester will be available at the conference.

4. CONCLUSION

Student response to an extra credit offer of making a creative or artistic expression has been unexpected and not positive with one excellent exception. Efforts continue to engage students in the subject matter in creative ways. This paper is a work in progress towards such a goal. The author welcomes suggestions and comments.

Consideration is being given to making a similar assignment as a mandatory aspect of class at the suggestion of Ressler (2004) similar to any other assignment in class like homework. Ressler indicates that students may be more likely to respond and put more effort into the assignment if they are required to do so. The primary goal of the assignment is to get students involved in the subject matter. This is based on the premise that students who are more involved with the subject will learn more completely. Additionally, if the assignment is fun and entertaining, students may not characterize the assignment as “work”. A decision to require a CAEX assignment may occur after the tenure process. The tenure process and concern for lower evaluations from students hinders some novel class activities from being introduced by the author. It is anticipated that the assignment can be improved in the future. However, neither this extra credit offer, nor any similar assignment, was continued during the Spring 2005 semester.

REFERENCES

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APPENDIX A

Assignment Sheet

Extra Credit Tender
Falls 2004
Classes instructed by Assistant Professor Devine

Synopsis:

Review topics covered in future sessions of class.

Form a creative or artistic expression about this topic.

Document your expression.

Details:

Review the plan of topics in class, read through some of the class textbook or other references, or discuss topics with the instructor.

Form a creative or artistic expression in some manner such as music, poetry, short stories, drawings, dance, sculpture or other creative or artistic product. You can find existing songs, poems, stories, photos, or drawings that are related to the topic. You may create your own song, poem, story, photo, dance, or drawing. You can alter existing creative or artistic expressions such as writing different lyrics to a song or creating a montage of images. A myriad of other types of expressions are possible.

Document your expression in some manner and provide this documentation to the instructor. The documentation should be provided to the instructor 1 week prior to a relevant class session in order to be eligible for maximum credit. CDs, cassette tapes, digital images, and written documents may comprise your documentation. At a minimum, a written document with your name and date submitted must also include the class, class topic, and short narrative of your expression and how it relates to the subject matter in addition to a statement mentioning if you permit your name to be publicly identified in class and out of class for the work you have done. The relationship of your expression to the subject matter can be real or imagined. Be creative.

An additional credit to the semester grade percentage up to a maximum of 1% will be awarded to any student who adequately completes this tender. Each student may complete this tender up to a maximum of 3 attempts. Multiple attempts should illustrate increasing effort and creative & artistic value.

The primary purpose of this tender is to encourage students to become more involved in the subject matter as well as promote creativity. A secondary purpose of this tender is to entertain students in class with something that relates to the subject matter. The audience for this tender is other students in class.