Elements of Visual Literacy and Presentation Design from First Year Student Projects

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ABSTRACT

A problem solving project has been given to first year students in an introduction to engineering class over a number of years. The students present their work including their process and method and proposed solutions at the end of the semester. These projects can vary from improved laundry or eating facilities to improved lighting on cars. The focus is on the problem solving process. Typically students create presentations in software (Powerpoint). Working in collaboration with a visual arts faculty member in the department of Fine Arts a review of first year problem solving design presentations was conducted. A side by side comparison of the original and revised presentations led to some conclusions about best practices and elements of visual presentation design to teach to engineering students. This was presented to a subsequent year's class of students to improve their presentations. An evaluation rubric is being developed for this year's class as a baseline for refining the education of students in visual literacy. This is a crucial but often neglected element for every student, but especially in an engineer's education.

INTRODUCTION

A version of a first year introduction to engineering course is offered that is open to all students of all majors. About 1/3 of the students continue in Engineering, 1/3 in business majors and 1/3 in other science, humanities or social science majors. The course may as part of the general education core curriculum for students. The learning aims of the course include having students be able to distinguish what makes engineering different from science and what are the elements of an engineering problem solving or design process. Most students learn of the scientific method but far fewer learn anything explicit about an engineering or problem solving methodology. This methodology is found in a wide variety of professional disciplines including project management, computer science, software engineering, product development, creativity, innovation and areas of business administration. The names and numbers of the steps may vary, but the point is to introduce the students to the essentials of (1) problem definition, (2) identify users, stakeholders and their needs, (3) brainstorm solutions and creativity, (4) evaluation possible solutions, (5) prototype solutions, (6) evaluation and iteration of the design process.

The culminating project for students in this class is described as just such a problem solving project where students take familiar problems that they encounter in their transition to residential living on a college campus and walk through some of these steps, without an prototype and build elements. They present a powerpoint presentation and a brief paper on the last day of class. Over the years the question of what constitutes appropriate expectations for such a presentation began to grow in this instructor's mind. There are rubrics available (REF) to evaluate presentations, but still it felt like something was missing. A more in depth knowledge of the mechanics of what went into an outstanding vs. a good or fair presentation seemed to be missing. In partnering with a faculty member from the Fine Arts department the language of visual analysis were brought to bear on these presentations.

Students were presented with two side-by-side powerpoint presentations to compare elements of composition, line, font, message, and images. One class was devoted to a guest lesson by the fine arts faculty member on fundamental elements of "visual literacy" which included what to look for in terms of visual consistency and where and how to store, find, and maintain libraries of digital images. Simple techniques such as creating borders around images and understanding pixel size, density, and image aspect ratio helped to improve student presentations. The design of presentations and effective communication and its associated mechanics are fundamental skills for all educated people in the 21st century, just as the mechanics of writing different forms such as a memo or an internal report are an expected part and parcel of a professional engineers toolkit. Edward Tufte prominently among others has pointed out that effective graphical and technical communication can make the difference between life and death in some situations such as the two shuttle disasters. Working with a colleague from the Fine Arts field provided the language and vocabulary in which to address and understand this need and skill more deeply. Some example powerpoint images from the tutorial should illustrate the points well.