

Lost in Translation _ Diverse Means of Design Communication

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Abstract

The objective of this study is the observation, documentation and evaluation of students' ability to effectively communicate technical information across disciplines. The framework of the Scholarship of Teaching & Learning (SoTL) research initiative, enabled the team to update and invigorate the interdisciplinary academic relationship between the Design Department and the Engineering & Technology Department at the University Wisconsin Stout. The study was conducted in the context of a dialogue between a technical course (ETECH-256 'Engineering Graphics and Solid Modeling') and design courses (DES-232 'Industrial Design 2', DES-331 'Industrial Design 3'). The study is fundamentally based on faculty collaboration – with the awareness that individual instructors can certainly find engaging activities for students to mature their abilities, but a collaboration can mimic situations that might happen between consultants in a professional design setting.

Introduction

Early on, the objective of the study broadened, as the team realized that there is a larger teaching opportunity available, by engaging students in the understanding of the Industrial Design Process, the interdisciplinary team members involved in that process, and the communication and collaboration tools most appropriate for each of those team members; including a general discussion of the 'emotionally' driven and the 'technically' focused 2D and 3D visualization tools, employed throughout a product design process.

A literature search looked at some specific teaching recommendations of Whitehead, A. N. (1929) in *The Aims of Education*, New York, NY: The Free Press. Whitehead wrote critically about the late nineteenth century art academies and the need for a stepped sequence of romance, precision and generalization to foster the creative spark within each student and slowly build and mature their creative and visual skills. Additional inquiry looked at major US Industrial Design Programs and their integration of technical skills into the training for creative professions. Respectively the technical course was reviewed in the context of engineering graphics education provided to students at similar institutions. 'ETECH-256 Engineering Graphics and Solid Modeling' and 'ETECH- 266

Surface Modeling' are part of a course sequence that includes the principles of technical communication standards, descriptive geometry, scales, unit systems, dimensioning and tolerancing standards, as well as the introduction of parametric modeling and surface modeling.

This course sequence is available to students of engineering programs but was specifically developed to address the needs of students enrolled in the Industrial Design program. The graphics courses required for the different engineering disciplines are being reviewed parallel to this study. Industry advisory boards and outcome strategies of the accreditation board for engineering & technology (ABET) value not only students' technical skills, they expect educational objectives to include introduction, practice and assessment of professional competencies. This study is a practical example to include competencies of commitment to quality, timeliness, and continuous improvement as well as professional responsibilities within the context of a team.

During the fall 2018 and spring 2019 semester, activities and assignments of DES-232 or DES-331 were used to challenge the technical modeling skills of students in ETECH-256. It was observed that students working on models for an actual design are more engaged and focused on a successful outcome of their work – even though the design is not their own. For instance, students were given sketches created with pen and marker in the context of an ergonomics study of tools and had to interpret the designer's intent, to be able to model the tool based on the sketch. This was a particularly difficult exercise since the ergonomic shapes required students to employ sensitivity in interpreting the design intent and a high level of modeling skills. In another situation students were given sketches of new products designs – the given images were focused on emotionally engaging an audience and delivering the products branding message. In this case students had the liberty to interpret the design based on understanding of the part's function and manufacturability. The most successful exercise was a variation study – students were given a series of sketches of coffee makers. Students in the ID course explored variations of function and proportion, and students in the ETECH class could apply their modeling skills to create mass models. This exercise turned out to be most appropriate to students' modeling skills at this point in the semester, and their ability to translate scale, dimension and proportion into a part model. In addition, the need to apply materials and context to their models was most useful for students at this point on their educational path. Unfortunately, the workload and scheduling of DES and ETECH courses did not allow to schedule dialogue between “designers’ and “modelers” – nevertheless the outcome generated in the ETECH class was shared and discussed with students in the DES course sections. In the effort to bring participating students together and reinforce the relevance of focus and accuracy in technical communication - an evening event was organized titled ‘Lost in Translation’. A “Baldrige Grant” was awarded to the team to provide tools, supplies and refreshments to students during the event. Twenty students participated in the event, although the campus experienced a major snowstorm on this evening. Students were faced with the hypothetical challenge of having to verbally describe an

object over the phone to a colleague in an overseas manufacturing facility. Students got comfortable in two different classrooms. One group was provided with sketches of imaginary objects; the other group received randomly selected phone numbers that allowed them to contact members of the first group. Students were only allowed to use their descriptive ingenuity without any transfer of digital images to define objects over the phone. The second group sketched the objects as they understood the verbal description. Student feedback after the evening event revealed some expected and some unexpected responses.

A survey tool was developed and administered at the end of the academic year, it was reviewed by the IRB board and approved for use in the study. The tool was distributed to the students enrolled in the ETECH 256 and DES 232 classes, at the end of the spring 2019 semester. Poor participation in the survey resulted in minimal evaluation data for the study's initiatives. The timing for the survey seems problematic with the course evaluation surveys running concurrently and students' priorities focused on end-of-semester project completion. The intent for the survey is to provide longitudinal results for long term efficacy that can be integrated into the curriculum. Most insight would be gained by administering the survey before the beginning of class and at the end of the semester. Another option might be to eliminate the survey and focus on a formal documentation of discussions and students' narrative feedback. Discussions for the upcoming academic year include options of either refining and streamlining the activities to make the process more readily available to other colleagues, adding other communication components to include "writing" and "making"; or digging a bit deeper into the barriers and hesitations frequently observed in team-teaching – by exploring what administrative or cultural barriers hinder us from truly bridging an expertise gap. This approach would include a literature study and a study of historic precedence.