DESIGN STUDENT ACCULTURATION THROUGH COLLABORATIVE PROJECT ASSESSMENT

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ABSTRACT

Acculturating young design students to the methods and languages of our common design traditions is for many an unpleasant experience because of previous training in rigid school systems emphasizing linear thinking, right or wrong answers, and strict adherence to established guidelines.

This paper reviews how students are acculturated into designerly ways of thinking through a four-step process using collaborative product assessment as the vehicle for learning. Collaborative learning is where students work equitably as they progress to common learning outcomes. The four steps are: 1) the professor models project assessment, 2) students anonymously rank peer work, 3) students rank peers work face to face, 4) a pair of students assess and rank a single assignment for the entire class.

To verify the success or failure of this process a survey was conducted on twenty-two freshman design students and thirty-nine sophomore, junior and senior design students to uncover how their collaboration efforts change with time. The overall peer trust increases among the freshman class and is generally high among the upperclassmen. Trust towards the professor decreases each year until the student's senior year when it increases again. This indicates an increased sharing of knowledge authority among the students and positive disposition for collaboration.

Though this paper specifically addresses collaborative assessment, intentional acculturation of all designerly ways of thinking and doing allows students to sincerely evaluate whether or not they want to pursue design as a career. For those who continue with the program engaging in these acculturation steps encourages students to become independent, confident and thoughtful designers of impact.

Keywords: Studio learning, industrial design, cooperative, knowledge authority, design criticism.

1   INTRODUCTION

This paper presents how we introduce first year industrial design students to the notion of collaborative learning. "Collaboration is in evidence when interdependent, autonomous stakeholders with their respective competency domains mobilize resources, and both harmonize and synchronize their operations to solve shared problems, meet common needs, capitalize on important opportunities, and obtain prized benefits" [1].

Collaborative learning intended to create autonomous, articulate, thinking individuals is typically both more difficult and rewarding than anticipated [2]. Many students have been exposed to cooperative learning, where they work towards a common end, but few have experienced collaborative learning, where they are expected to share the workload equitably as they progress towards learning outcomes [3]. For example, students often work in groups where they share their experiences and attempt to achieve a common goal. Some of these groups are formal university organizations and clubs while others are informal gatherings whose purpose is to share a hobby or accomplish some sort of group effort [4]. While these collaborative ventures are useful to the students, they do not naturally collaborate where it could be highly beneficial, such as academic erudition. The benefits of collaboration include greater efficiency, effectiveness, and perhaps most important for higher education institutions, it can enhance student learning [5], [6].

This paper reviews the introductory visual literacy course in the industrial design program at Brigham Young University, which is the student's first introduction to the discipline of industrial design. Typically 20 to 24 students attend the eight-week course. The first half of the course introduces the nature of aesthetics and proportion. These principles are exercised through six two-dimensional assignments using Adobe Illustrator. The second half of the course explores these same principles through five three-dimensional assignments using Bristol board, foam core and balsa wood.

Though theses assignments, students learn concept development, how to develop positive and negative space, craftsmanship, and aesthetic judgment. It also exposes students to the tools and methods of design that will best prepare them to apply for entrance into the professional design program that students apply for at the end of their freshman year.

Another aim of the course is to acculturate students to collaborative project assessment and designerly ways of thinking and doing, such as iterative processes, embracing ambiguity, and collaboration. Acculturating young students to the methods and languages of our common design traditions is for many a dramatic and unpleasant experience because of previous training in rigid school systems that emphasize linear thinking, right or wrong answers, and adherence to guidelines. Easing students into this world of collaborative criticism and subjective project feedback should be made as painless and enjoyable as possible.

First year industrial design students hesitate to trust their peers in a studio environment. In contrast to lectures, studio classes necessitate more participation from the students. Here, the students are expected to contribute their opinions as much as the professor. In BYU's industrial design studio classes, the professors assign the students tasks that involve some physical or digital composition that they are to bring to class for discussion. The students are to generate project solutions and share their unique perspectives so that everyone can collaborate towards a common goal. In this new environment, the students may feel vulnerable and thus have a difficult time collaborating with their peers. Those unfamiliar with the design studio environment may be shocked to find that they have to openly and fairly evaluate their own work as well as the work of their peers.

The course curriculum for the introductory visual literacy course centres on project creation and assessment and exposes the students to key vocabulary and cognitive concepts to develop aesthetic judgment. Students often view these collaborative exercises as meaningful ways to improve their own projects. However, the more meaningful goal is to assimilate them into the broader design culture, where open, honest, and meaningful project centred collaboration occurs without personal affront. Students who embrace these methods have taken the first important steps to acculturate themselves into the world of design.

2 THE FOUR STEPS OF ACCULTURATION

Because introducing students to designerly methods and ways of thinking is a dynamic and potentially confusing experience for the students, professors slowly introduce methods and activities that may cause discomfort. This process occurs in four steps: 1) the professor models project assessment methods and criteria, 2) students anonymously rank their peers work, 3) students rank peer work face-to-face, 4) a pair of students assess and rank a single assignment for the entire class. These steps are introduced gradually over the course enabling students who are unfamiliar or uncomfortable with public assessment of work to acculturate little by little into the designer assessment culture.

To help accomplish these steps, a few simple guidelines are used. First, the word 'criticize' is rarely if ever used. The students might use it, but the professor strives to remove the word from his vocabulary. Instead he uses the words 'good', 'better', and 'best' as ways to inform students where their work stands in comparison to other works on the table for discussion. The students soon pick this vocabulary up as well. The choice of words keeps the discussions on a positive and enabling tone. Second, the works are never graded in class. Instead, they are ranked, ideally from 1 through 20 or however many students are in the class, but practically into groups of good, better, and best. There is no requirement for the number of pieces in any of the three groups. For example, if there is only two or three best projects, that is perfectly acceptable. Eventually, the students realize that the best group size can be small or large, depending on the quality of the work placed on the table.

2.1 Professor assesses student work

The first step involves the instructor modelling appropriate methods of project assessment by publicly discussing the strengths and weakness of each student's individual work. The professor may also rank the work into 'good, better, best' design work if he feels it is appropriate. This step occurs during the first one or two assignments of the course. The professor verbally repeats during this process that the positive and negative aspects of any given piece of work is not representative of the individual, but only of the work itself. This step begins to instil the importance of separating the value of a work from the value of the student. This process lays the foundational principles of how to judge 'good, better, best' design work while demonstrating appropriate design concepts and vocabulary and their meanings.

2.2 Students anonymously assess other student work

The second step involves the students assessing and ranking the work of other students not at their table. This occurs during the second or third assignment of the course. There are typically five groups of four students each sitting at square shaped sets of tables. The tables are not lined up in the classroom, but placed randomly as islands throughout the classroom. Students are asked to leave their project at the table they initially sat at and then physically stand and move to another set of tables. Here, the students are asked to assess and rank the students work found in front of them.

Noticeably, students are not comfortable assessing the work of other students at this point. The concept of openly discussing another student's work and ranking it against its peers is a new concept for them. There are two subtle but key aspects to embrace during this step. First, it is important to have the owners of the work physically distant from the work being discussed, thus allowing the students to freely explore how to assess a project. Second, it's important that the students rank the work on the table good, better, best instead of grading them. When students are asked to grade work, they typically give the majority of projects high marks. In comparison, when asked to rank them, students begin to see the strengths and weakness of a given work in comparison to the work next to it. They learn that all work can be ranked good, better, best and that all work is not worthy of a high mark.

Typically in this step, students rely on their personal prejudices, their likes and dislikes to assess a project. At this point the students are challenged to explain their method of assessment. What criteria do you use to assess the work? Is it meaningful and consistent from table to table? At this point, the students are introduced to a basic rubric for discussing the value of a project: concept, execution and aesthetic appeal. These categories roughly align with the classic rhetorical principles of logos, ethos and pathos. At this point students are asked to rank each of the projects in front of them by those three categories. They attach a Post-It note to the project and write the projects rank for each of the concepts. This allows two things to happen. First, the student starts to understand what each of the categories mean and the distinctions between them. Second, the Post-It note records for the projects owner how it was assessed in each of the categories.

At the bottom of the Post-It note, the students are asked to suggest how the owner could improve their work. This introduces the notion that one role of a designer is to assist anyone's project in becoming the best that it can be. Finally the professor comes to the table and reassesses the student ranking. He makes corrections and explains why, thus reinforcing appropriate choices and correcting weaknesses. This is the first step in moving knowledge authority away from the professor and sharing it with the students. In ranking work, the students demonstrate their knowledge and test their ranking efforts against the professors. The class also begins to learn the strengths of certain students in the class, leading some to become known as proficient in some design trait that the class can rely on for insights.

2.3 Students assess work face to face

The third step involves students assessing and ranking the work of the students sitting at their own table, while including their own work in the mix. This is initially a stressful moment for the students and a few noticeably gasp in surprise at the request. We talk as a class about this important step in their acculturation as a designer, the ability to talk about their own work in conjunction with their peers' work openly, honestly and accurately. To aid this discussion, students are asked to add thoughtful insight into improving the quality of each piece on the table. Thus the students begin effectively collaborating to make each individual piece the best it can be. Each student benefits from this discussion and based on the input from their peers, is expected to make changes to the piece.

This collaborative activity of assessing and improving all the work at the table provides a number of designer acculturation outcomes. One, it reinforces the separation of the creator from the piece. Two, it teaches that collaboration leads to the better project results. Three, it demonstrates that their peers have knowledge authority that can be relied upon. Four, they gain confidence and independence as a designer with a valued and defendable position, rather than a student only seeking for a course grade.

2.4 Students assess work from the entire class

The fourth step is a culmination activity. On the final day of class, all the course projects are brought physically into the room and displayed. A pair of students is assigned to assess and rank every students piece from a single assignment, as shown in Figure 1. This exercise permits the students to demonstrate their knowledge of the design principles discussed in class and reflect on their own

confidence as an emerging designer. The student's rankings are not final; the professor goes through each assignment and adjusts the work accordingly.

Figure 1. Examples of student pairs assessing and ranking all the classes work from a single assignment.

3   METHODS

In order to determine how the aforementioned steps have affected the student's acculturation into design culture, we conducted a survey asking 61 industrial design students that are currently attending Brigham Young University how much they trusted their studio class peers opinions when collaborating on projects. We polled 22 freshmen, 16 sophomores, 14 juniors, and 9 seniors and asked them a series of questions. First, how often they had sought their peers' opinion; once, twice, or more than three times a week with assistance on a given project. Then, we asked the same question regarding project opinions for the teacher's assistant (TA), the professor, and online sources. Next, we inquired how much they trust each of those sources, on a scale from one to nine. They students were also asked how comfortable they feel assessing or judging the quality of their own work, a known group's work, and an anonymous group's work. In addition, they were asked how comfortable they were publicly discussing their own assignments as well as others'.

The survey also included questions such as how comfortable they were collaborating with their peers, working with assignments that have no right answers, and how much they understand discussions on visual aesthetics. Lastly, we asked how fluid they were in coming up with a number of ideas, and what they have learned in the class that was most unexpected.

All of the surveys had the same questions, with the exception of the freshmen's surveys, which asked about the TA, while the other years' asked about trusting students of different years since they have no TA's. The freshmen students were asked to complete the survey twice, the first time near the beginning the term and once again just before the term ended. The survey data was then input into a spreadsheet and the averages, standard deviation, maximum, and minimum were calculated.

4   RESULTS

Figure 2 below charts the results of the primary survey question regarding whom students trust to provide them meaningful insights to their current design project. The first time freshmen students were surveyed, they said they trusted their peers an average of 5.36, whereas they trusted the TA an average of 7.38, and the professor 8.64. The second time, the freshman's trust towards their peers increased to an average of 6.45, and the professor's trust increased slightly more for an average of 8.72. Their trust decreased towards the TA and reached an average of 6.18.

STUDENT TRUST

■ Freshmen before   ■ Freshmen after   ■ Sophomores   ■ Juniors   ■ Seniors
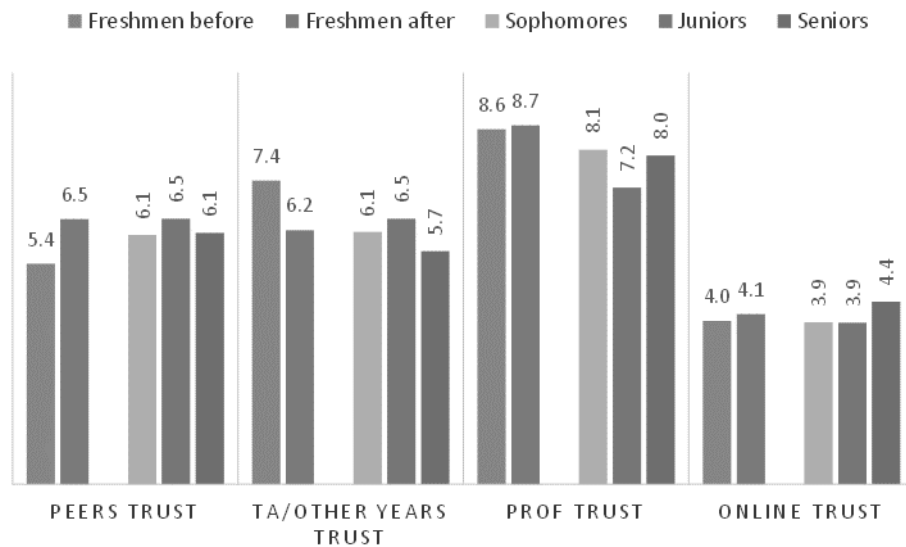
Figure 2. Showing how much freshmen, sophomore, junior, and senior students trust their peers, professors and online resources to provide them meaningful opinions regarding their current design project. In particular, note how quickly the freshmen students evolve within an eight-week course to embrace project collaboration.

When we polled the sophomores about their level of trust towards peers, their answer was higher on average than the freshmen's first responses, polling at 6.06, while their trust towards the professor was lower at 8.13. Since they do not have a TA, we asked about their trust towards ID students from the other years. This resulted in an average of 6.13. The juniors' average trust towards peers was 6.36 while it was 7.21 towards the professor and 6.46 for other years. Lastly, the senior design students trusted peers at an average of 6.11, other years at 5.67, and their professor at an average of 8. The overall trend shows an increase in trust towards peers until the senior year, and a decrease in trust for the professor, again until the senior year.

5   DISCUSSION

Since we polled 96% of the entire population of BYU's industrial design students, we can conclude that these results are statistically significant. As the chart shows, the overall peer trust increases over time, while trust towards the professors and other year's student's decreases. Online trust remains fairly constant, although it does vary slightly.

A common response to the question about the most significant thing the students learned was that they were surprised at how different everyone's work and opinion is. They learned that through collaboration, they are able to answer questions about their own work they would have not thought of and solve problems they simply could not get past on their own. This may explain the peer trust increasing trend.

While peer trust increases over time, professor trust seems to gradually decrease until the senior year as well. One theory that could explain this is that as student's progress through the program and have the same teachers repeatedly, they begin to see their professors' faults and become more sceptical. BYU requires that industrial design students procure one internship that typically occurs between their junior and senior year. This real world experience may help seniors realize that what their professors have taught them was vital at their new job and they re-value the professors as experienced designers with thoughtful insights.

Additionally, senior students take on independent projects and meet less frequently as a class, which may explain why their trust towards peers drops while they trust their professors more. It seems that the more they have acculturated to a collaborative environment, the less necessary this becomes. Collaboration is a tool for them, and they have learned to use it as needed. This is the type of autonomy and skill professors hope to instil in their students, which begins with the process of acculturation in the introductory courses.

6   CONCLUSION

Though this paper specifically addresses collaborative assessment, intentional acculturation of all designerly ways of thinking and doing allows students to sincerely evaluate whether or not they want to pursue design as a career. Those students who enjoy the new ways of thinking and working continue on in the program and those who struggle with them typically move onto other majors. Participation in these four steps to collaborative assessment has demonstrably increased freshmen students' ability to collaborate with each other. This early training also shows positive affect in their attitude towards collaboration as upperclassmen. The knowledge authority of the professor decreases with time as the student's confidence increases. Success in enhancing these typical design-centric categories demonstrate the effective acculturation of young design students into the contemporary design world. Engaging in these acculturation steps encourages students to become independent, confident and thoughtful designers of impact, well prepared to enter the world of business.

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