ENHANCING COMUNICATION SKILLS THROUGH STUDENT AND ENTERPRISE INTERACTION

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ABSTRACT
Collaboration between a university and an industry is a common way to create "realistic" student projects that provide opportunities for gaining useful knowledge of "real-world problems," skill development, and project management. To use university-industry collaboration as a way of teaching communication is not new. However, most courses using this approach focus mainly on written and verbal communication. A case study of a second year bachelor's level product design course, which focused on project-based learning as a pedagogical platform, was used as the primary research method. This research aimed to conduct further inquiry into how external collaboration can contribute to more holistic communicative learning. The findings indicated that this approach leads students to a more holistic communicative understanding. Furthermore, using student-driven processes resulted in better communicative insight than teacher-driven processes. The processes did not necessarily lead to increased semantic awareness; however, the course created an arena where students could adjust their semantic perceptions. Both student- and teacher-driven processes created engaged students and the possibility to build individual strength in students through conquering fears and attaining the satisfaction of achievement. However, there were some cases of students not handling the pressure of delivery.

Keywords: Learning space, enterprise collaboration, communication, semiotics, project-based learning.

1 INTRODUCTION

Several researchers have claimed that product design cannot or should not be performed without the intention to communicate [1-3], and that design is about making sense of things. The Swedish designer and semantic researcher Rune Monö [1] said: *"Product design cannot exist without the intention to communicate."* To design for product understanding, the student must develop consciousness towards using communicative elements [1]. One way of creating communicative awareness in product design education is through projects, such as this one, which focused on increasing students' awareness towards the communicative complexity of design and communications potential to make understandable and desirable products. The assumption is that product design students working with external partners increase their awareness of communication as a tool. In this research, communication is viewed as a holistic communicative awareness regarding issues such as, product semantics, semiotics, written and oral communication and communication with consumers and industry, with focus on how this communication affects the design process.

2 BACKGROUND

The psychologist Gregory Bateson claims that one cannot not communicate [4]. According to Rune Monö [1], signs in artifacts are all elements that can be interpreted through our senses and that give meaning to an artefact. In other words, it is what we call product semantics. Semantics in design have been developed for half a century, but the term "product semantics" was first introduced by Butter and Krippendorff in the Industrial Designers Society of America's (IDSA) journal *Innovation* [5]. They define product semantics as both [6]:

Deleted: artifact

- A systematic inquiry into how people attribute meanings to artifacts and interact with them accordingly.
- A vocabulary and methodology for designing artifacts in view of the meanings they could acquire

for their users and the communities of their stakeholders.

It is communication in all the signs we use in the design of artifacts [1]. Due to this, communication should be viewed as an important and integral part of design. Areas of communication, such as aesthetics, semiotics, touch points, branding, and verbal communication, are often addressed through product development. Aesthetics is a useful communication tool that can lead to products being perceived as more functional [7]. Furthermore, semantic awareness is important for the designer to create understandable and emotional products [1, 3, 8, 9]. Krippendorff [3] emphasizes a semantic turn within product design. He demands that designers shift their attention from the design of material artifacts to the design of artifacts whose meanings enable desirable interfaces to arise. In this context, teaching holistic understanding of communication is important within design education. After graduation, most design students are inclined to work with industry. To prepare students for this, it is important that they gain field experience regarding design development and communication skills [10]. It can be challenging to achieve this within the learning space of a school.

2.1 Industrial collaboration

Most design schools implement industrial collaboration in their curriculum; this leads to students gaining useful knowledge in "real-world problems," skill development, and project management [11]. The National Academy of Engineering, the American Society of Civil Engineering, and other experts in the field of engineering education concur that so-called "soft-skills" are necessary for students to succeed professionally upon graduation [12]. However, this knowledge can encompass a variety of issues [13], and within design research, there has been little focus on enterprise collaboration as a tool for communicative learning. Some universities have courses which combine design, communication, and enterprise collaboration like the Engineering, Design, and Communication (EDC) course at Northwestern University [10]. This is a successful course that proves the usefulness of combining industrial collaboration with communicative learning. However, these courses seem to have their focus on written and verbal communication, while issues like product semantics are of lesser interest. To some degree, EDC [10] separates design and communication by viewing them as two disciplines taught within the same course. Several researchers [1, 3] have viewed this in a more holistic way, seeing communication and design as one thing. Krippendorff claims, *"design is making sense of things"* [14], and says this phrase can be read as *"design is a sense creating activity,"* or it could mean, *"the products of design are to be understandable to their users."* Viewing design and communication in this holistic perspective indicates that it can be useful to view collaboration with external partners and communicative learning in a wider sense.

2.2 Project-based learning

Lantada et al. [13] described project-based learning (PBL)—together with funded final degree projects—as the most valued strategy for linking a university with the "real" industrial world. PBL is a model that organizes learning around projects. PBL has similarities to problem-based learning [15]. Within the research on PBL, there is diversity in defining features coupled with a lack of a universally accepted model or theory of PBL, which has resulted in a great variety of PBL research and development activities [16]. To sort this out and answer what a project must have in order to be considered an instance of PBL, J. W. Thomas [16] established five criteria:

- PBL projects are central, not peripheral to the curriculum.
- PBL projects are focused on questions or problems that "drive" students to encounter (and struggle with) the central concepts and principles of a discipline.
- Projects involve students in a constructive investigation.
- Projects are student-driven to some significant degree.
- Projects are realistic, not school-like.

2.3 Research question

When working with external partners, students increase their learning spaces, both physically and mentally. Physically, this can include field trips or external meetings. Mentally, it can be about challenging their comfort zone and forcing them to place their design in a context. To investigate how students can learn communication skills through out-of-school experiences, the following research question was asked: How can design students enhance their communication skills by working with external partners?

3 RESEARCH METHODS

The primary method used in this research is a case study [17] of a 10 ECTS[1] second-year, bachelor-level course named "Communication & Presentation." Different approaches were practiced over a six-year period, and an average of 40 students each year collaborated with external partners using teacher-driven or student-driven processes. The research question was analyzed through participatory observation in class, archival studies of students project reports [17], course evaluations, and reflections. The process used in this course can be described as project-based learning [11, 16]. This method was used as a pedagogical tool to increase learning in the process and to achieve communicative insight.

3.1 Teacher-driven process

Initially, the course ran as a teacher-driven process. The course leader established collaboration with four to five enterprises, and students signed up for the collaboration in which they wanted to participate. Students worked independently or in groups of two or three, resulting in several students or student groups working on similar tasks. This way of organizing focused on the course leader arranging meetings and following up the collaboration with the enterprise.

3.2 Student-driven process

After two years of running teacher-driven processes, students got the opportunity to choose between established collaborations or arranging independent enterprise collaborations. This offered an opportunity for student-driven processes; students located their own partners and arranged the collaboration work, meetings, and follow-up. This was the main approach during the final two years of the study. It was essential for both teacher- and student-driven processes for the student to establish their own problem definition or research question. This criterion is a subtle one in PBL projects [16].

4 RESULTS

The findings of the study showed that students increased their communicative insights through experiencing challenges first-hand. Student-driven processes expanded the communicative learning to a larger extent than teacher-driven processes. In addition, the communication process affected the design development. The process did not necessarily lead to increased semantic awareness, but it created an arena were students could adjust their semantic perceptions. Working with external partners provided students the opportunity to build individual strength through conquering fears and attaining the satisfaction of achievement. However, there were some cases of students not handling the pressure of delivery.

5 DISCUSSION

5.1 Collaboration work through project-based learning

It seems that most design schools run teacher-driven processes in their organized collaboration work [13], although there are many exceptions, especially on final bachelor exams and at the master's level. A teacher-driven process takes fewer risks because it gives the teachers control. When students collaborate with an industry, they function as representatives of their schools. Not controlling this process can, in the worst case, give the school a bad reputation; it is risky to allow second-year bachelor students to run their own collaboration projects. There are many pitfalls regarding themes such as project organization, communication, and intellectual property rights. However, addressing these issues using project-based learning can create a prosperous learning experience [11]. To ensure good projects and satisfied industrial partners, it is important to follow up on the projects. In this case, it was done through tutoring and milestone meetings where students shared their experiences and not only discussed but also received advice on further communication with their partners and the development of their design. In addition, they attended lectures and workshops on communication to prepare them for the task. Previous projects had given them experience through teacher-driven collaboration work. We emphasized the importance of presenting collaboration partners with realistic goals for the project; if the gap between what the company wants and what they get is large, the students will not be good ambassadors of the school.

[1] The European Credit Transfer and Accumulation System

"To work with a real external partner has been fulfilling. These tasks are very useful regarding preparing oneself for the real working life as a designer." This statement from a student's reflection exemplifies that students felt external collaboration work through student-driven processes was relevant to their future occupation. Furthermore, it shows that they enjoyed this approach to learning. Another student expressed something similar: *"I feel I learned to take a very realistic approach to my design, highlighting how I would hope to work in the future as opposed to undergoing the process like any other school project."* Both of these examples illustrate a strong expression from most students. They enjoyed struggling with "real-world" problems and felt they learned a lot from the process, specifically mentioning the connection this learning had with their future work as designers.
For a project to be a PBL, it must be realistic and not school-like in nature [16]. Realism is more present in student-driven than teacher-driven processes. When teachers arrange meetings and fieldtrips with several students participating, it creates a more school-like setting. Another criterion for PBL is that it is student-driven to a significant degree. One can argue that the student is the main driver in teacher-driven processes. However, it seems that the student has a stronger position as the driver for student-driven projects. In most cases, a teacher-driven process is not a PBL project due to its more school-like position and the weaker student-driven approach. Teacher-driven projects fit better into the category of problem-based learning [15]. According to Lantada et al. [13], PBL is the best approach to industry-university collaboration work. This view corresponds with the findings of this study.

5.2 Semantic and aesthetic insight

Running student-driven processes where they worked with external partners did not necessarily lead to increased aesthetic and semantic awareness, and student insight regarding this varied. For this to occur, focus on the issue through tutoring and lectures was usually necessary. Nevertheless, the process, including tutoring and milestone meetings, created an arena were students could adjust their aesthetic and semantic perceptions. Most students showed increased insight into the field of semantics. One student said: *"I have actually caught myself, sitting on the bus, thinking about how traffic signs are a good example of semantic signs."* The relationship between signs and product understanding could also be found in several projects, exemplified by this student statement: *"Several aspects regarding the product feel more controlled now than before. This is the most important lessons I have learned in this subject."* This is an important insight that corresponds with Monö's ideas, as he emphasized that design semantics shall lead to artifacts expressing their intended characteristics in a comprehensible way, both regarding use and identity [1]. This is further exemplified through a student who expressed increased knowledge of hidden meanings and agendas behind products. *"To analyze and decipher elements, messages, and underlying goals behind products is contributing to consciousness regarding both being a designer and a consumer."*

5.3 External collaboration – a tool for communicative learning

Working with external partners creates engaged students. Students wish to perform well when a third party is expecting excellent results and efficient delivery. One student expressed, *"I had a greater drive to achieve not just quantity, but quality in the design to provide a worthwhile experience for not just myself, but for the company, who took the time to involve themselves in this process."* Many see this kind of project as an opportunity to establish contacts and build a portfolio as a way to increase employability [12, 13]. A statement from two collaborating students' project report supports this view: *"For us, an important aspect throughout the project has been to develop a concept that could be realized."* However, it can be scary to challenge one's comfort zone when they seek collaboration in the "real world." Several students confirmed this. One stated: *"It was scary to ask one of Norway's largest furniture manufacturers, but I am glad we dared because during this course, we have learned a lot from the collaboration."* For most students, this is a positive force, which engages them to focus and perform well. However, some students aim too low or too high. Aiming too low can result in meaningless design tasks with little interest for both the collaborating partner and the student. This occurred with two students who were designing a shelf for a company. Ultimately, their partner only wanted a small shelf in his office, and he had already decided he wanted it to look similar to a shelf available at IKEA. Therefore, he obviously wanted carpenters, not designers. Their tutor advised them to change to a different collaboration partner, but they lost a lot of time in the process. Conversely, some students aimed too high, taking on complicated tasks that resulted in insufficient designs, followed by depression and sick leave. To make collaboration an effective tool for communicative

learning, students must challenge themselves on the correct level. Most aim high without aiming too high and succeed. More importantly, these challenges create learning that would not have occurred in a teacher-driven process. Through struggling with communication with their partners, meeting arrangements, and misinterpretations, the students can derive knowledge for future encounters and projects. Thomas [16] emphasizes that the central activities of the project must represent difficulty to the student to be a PBL project. The project is an exercise if it can be carried out with the application of already-learned information or skills. Working with an external partner increased the pressure on the student, and in most cases, increased pressure motivated and enhanced learning.

5.4 Learning communication through student-driven processes

Working with an external partner can be a useful tool for development of enhanced communicative skills. Students used communication as a tool for product development in their process. An example is a project run by two students who worked on a chair for a large furniture company. To gather customer feedback on chairs, they conducted a workshop (Figure 1). The workshop took place in the furniture shop, and customers were encouraged to participate. The workshop generated important information regarding the customers' wants and needs concerning chairs. The feedback provided insights that affected the result on an aesthetic and product/ semantics level. In addition, it was a useful tool for gaining insight into communication strategies, illustrated through this statement from one of the participating students: "*The workshop made me conscious concerning how different ways to present a problem definition to the customers gave different information.*" These students clearly used communication as a tool for product development.

Figure 1. Student-driven workshop at a large furniture shop

In another interesting example, two students worked with a local elementary school. The municipality decided in 2012 that this school would be a profile school in the subjects of mathematics, science, and technology. This knowledge became the inspiration for further work for the students. They used interviews and workshops with teachers and pupils to develop commission work for the school. To aid the process with their partners, they derived the words inclusive, curiosity, and innovation from the interpretation of their research. In addition, they made symbols for these words to use as communicative tools. This close communication led to solutions that would not have occurred in solitude. Additionally, their participation in the process created ownership for both pupils and teachers. The result focused on curiosity, learning, and the school's profile; the solutions became identity builders, pedagogical tools, and decorative elements.

Both examples illustrate ways of using communication as a tool for product development. All of the student-driven projects used communication as a tool. This did not appear to the same degree in teacher-driven processes. This shows that, at least in this study, the student-driven process is a better tool for communicative learning than the teacher-driven process.

6 CONCLUSION

This paper discusses a way to teach students communication skills through enterprise interaction. The research clearly indicates that to run a project as a student-driven process, rather than a teacher-driven

process, contributes to a more holistic communicative learning. This study ran student-driven processes within the criteria of project-based learning [16]. The method constructed a learning arena in which students challenged themselves and received both in-house and external dialog.

Most students showed aesthetic awareness and increased insight into the field of semantics. However, the student-external partner process did not necessarily lead to increased aesthetic or semantic awareness. It was usually necessary to focus on these issues through tutoring and lectures for this to occur. Nevertheless, the process, including tutoring and milestone meetings, created an arena where students could adjust their aesthetic and semantic perceptions.

Even though several of the projects resulted in objects or solutions that the collaboration partners used, the majority of the projects did not result in production/realization. In some cases, the exercise was more beneficial for the students than for the enterprise. It could potentially have a negative effect on the reputation of the school and the companies' impressions of designers if the industry meets students that are not sufficiently skilled to handle the task. This is something to consider when conducting collaboration with external partners. In contrast, the method can lead to design students developing increased communication skills regarding enterprise collaboration, which again can lead to the enhancement of future encounters with the industry. Further research is needed to clarify this issue. From a learning perspective, this method enabled students to challenge themselves, feasibly reach higher independence, and increase their communication skills.

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