Industrial Design Students’ Reflections on Cross-Institutional and Distance Collaboration

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Abstract: As an inevitable outcome of the increasing globalization of design and manufacturing of new products, distributed design teams bring new opportunities and challenges for creative engagements. In recent studies, there is a growing interest in the ways design teams collaborate and communicate. This paper builds on this strand of work by exploring a virtual design studio course conducted across three higher education institutions, Middle East Technical University (METU) from Turkey, Loughborough University from the UK, and University of Applied Arts Vienna from Austria, in 2017-18 fall semester. In this course, students work in teams in their home university, paired with another team from one of the other institutions. Each team writes a design brief and commissions it to the coupled team, who is then expected to deliver the design solutions. In the process, each team simultaneously works as clients and designers, interacting through online conference tools and e-mails, gives and receives feedback, and documents all the process on an online design process diary. Drawing on three sets of data derived from (1) systematic participant observation in every session, (2) reflective essays students submit at the end of the course, and (3) interviews conducted with students once the course has finished, this paper investigates how and in what ways pursuing a process-focused design studio provides industrial students with a different learning experience compared to their previous experiences in traditionally end-product-focused design studio courses.

Keywords: distributed design teams; design education; digital skills; collaboration

1 Introduction

As the role of design changes in response to both organizational and societal problems in the 21st century, competences required from designers diversify. For instance, it has been noted that since designers act more and
more often as value negotiators for businesses (Inns, 2007), design graduates require business-related and entrepreneurial skills (Press & Cooper, 2003; Kiernan & Ledwith, 2014). As such, versatility has become possibly the most key trait for design graduates, with an emphasis on the transferability of the designerly skills and tools across different projects and job definitions (Kiernan & Ledwith, 2014). For this, design students and practitioners are expected to reflect on their own practice and learning (Raein, 2005) and so develop competences for planning and executing design processes for diverse problems (Martinsuo, 2009; Kaygan et al., 2017).

Another major challenge for design education is the rising importance of collaboration for design work (Dykes et al., 2009). We witness the increase in the number of the design courses that incorporate collaborative work, bringing together students not only from design disciplines, but also from a wide range of programs. This includes disciplines such as law and sociology, which do not traditionally contribute their expertise to the solution of design problems like engineering and business typically do (BoyarSKI; Yang et al., 2005). Design collaboration stands out with its social character, in which communication as a creative activity needs to be fostered by the participants themselves (Feast, 2012; Kaygan & Demir, 2017). In such collaborations with other professionals, as well as non-professionals, designers are expected to take on roles as coordinators and mediators (Inns, 2007). This further highlights the importance of competences related to interpersonal relations, especially negotiation among team members.

As an inevitable outcome of the prominence of collaborative work, combined with the increasing globalization of the design and manufacturing of new products, distributed design work has become a part of the designer’s routine. Taking place across departmental, organizational or geographical boundaries, such work has called for the effective use of ICT and Web 2.0 technologies, from social media to efficiency apps. Management of distributed design teams, however, is more complex than that of traditional teams in which members work in the same physical environment (Monalisa et al., 2008). Developing tools and methods for communication, which is the primary condition of developing shared understanding among team members, is highlighted as a main concern for distributed design teams that collaborate through digital tools such as video conferencing (Larsson et al., 2002).

Reviewing the existing studies that focus on the transformation of the role of the designer in the 21st century, we identify three main challenges for today’s design education: (1) the need for more versatility and reflexivity, (2) the increased prominence of interpersonal skills, and (3) the use of electronic communication tools for collaboration. In this paper, we describe a design studio course that is organized in response to these challenges, as a globally distributed, cross-institutional and partially cross-disciplinary collaborative experience. The course has a focus on the process over the end-product, and on reflexive learning and interpersonal skills over technical design skills. As such, in this paper our aim is to understand how students interpret the learning outcomes of the course, especially in their comparisons of their learnings to their practice at the traditional design studio.

2 Virtual Design Studio

Our industrial design studio activities at Middle East Technical University have been shaped by the need to provide our design students with real life encounters with diverse stakeholders, including collaborations with industry and community partners, and with students from various disciplines across the campus (BöreKCI & Korkut, 2017; Kaygan & Demir, 2017; Kaygan et al., 2017). As part of this strategy, we have been running an undergraduate elective course called “Virtual Design Studio” as the METU leg of the Global Studio, which is a design course that has been conducted for more than a decade across various design schools in the world with the leadership of Loughborough University. The premise of the Global Studio is facilitating the development of skills of design students in cross-organizational and cross-cultural communication and collaboration. It also aims to enhance the working skills of design students in distributed design teams, since these skills are required to work in contemporary workplaces and globally networked organizations (Bohemia et al., 2009).

The Virtual Design Studio course, examined in this paper, was carried out in 2017-18 Fall semester and lasted for ten weeks. Each student team at METU collaborated with a team of students located in either one of the two other participant universities of the Global Studio: Loughborough University from the UK and University of Applied Arts Vienna from Austria. The project theme of the semester was “re-imagining a folklore” with a focus on the elderly. Within the frame of the project, students were expected to translate folklore into a designed item for elderly people. In this way, students gained experience of not only designing with other students from different cultures, but also designing for other cultures.

In the course, student teams are expected to deliver design solutions that meet the requirements specified in a design brief written by their paired team. In the process, each team simultaneously work as clients and designers, interacting
through online conference tools and e-mails, give and receive feedbacks and document all the process on an online design process diary. In 2017-18 Fall semester, the Virtual Design Studio had twelve students – seven women and five men – who were diverse in terms of their level: ten students were in the second, third and fourth years of their undergraduate education, and two students were from our M.Sc. in Industrial Design program. In the beginning of the semester, three groups of four students were formed. Each group was composed of students from various levels of study considering the skills and experiences they focus on at different years of education, and in order to ensure balance among the teams. While two of the three groups at METU were paired with groups of graduate students at the M.A. in Social Design program in Vienna, the other group became partners with a team of undergraduate industrial design students at Loughborough University.

3 Research Design

The research presented in this paper has been carried out by the three tutors at METU Department of Industrial Design. The empirical data comes from research conducted with the students who participated in the Virtual Design Studio course in 2017-18 Fall semester. We utilized three different and complementary sources of data with the aim of gaining a broad understanding of the students’ experiences, and to achieve credibility and validity in our analysis (Denzin & Lincoln, 2011).

The first source of data is generated through participant observation that was conducted in all sessions during the semester. Every week, each team presented in turns how they spent the previous week at the beginning of the course. Students discussed their weekly meetings with their coupled teams, where they were on the schedule and the difficulties they faced. After all the teams completed their turns, they worked in the class as a team for the tasks of the upcoming week. Observation notes were taken from the weekly reviews and classroom discussions, and from when students were working with their home teams in the class. Communication between team members and with the coupled teams, difficulties or problems teams faced and the strategies they adopted to solve them were the main aspects specifically paid attention to. The second set of data comes from the reflective essays that were individually written at the end of the semester by the students, with respect to their experiences in Virtual Design Studio. Thirdly, once the classes were over, interviews were conducted with eight students (out of twelve) who volunteered to participate in the research. At least two students from each group were interviewed. In order to make an in-depth exploration of students’ experiences in Virtual Design Studio, we utilized the interview guide consisting of three sets of questions, which are about the course conduct, teamwork, and design process.

The reflective essays and interviews were analyzed through a thematic analysis approach through line-by-line coding (King, 2012). Observation notes mainly provided contextual data for our analysis, and we referred occasionally to them to check how the students’ approaches to certain issues that have occurred during the course have changed over time.

4 Analysis

In line with the premise of the course, both observation notes and interviews show that students’ primary motivation for taking the course was the opportunity it offers for meeting and collaborating with design students studying in different learning cultures. In the first session, which focused on the course introduction, different students explained their motivations as follows: “I am most interested in being in communication with others abroad, [seeing] how we and they look at the [design] process [differently]”; “We see what it’s like in Turkey. I’m here to see how [design approaches] differ in other countries”; “My motivation is to work with students from other cultures.”

In the interviews, where students further elaborated on their motivations, some participants explained that by collaborating with students from other countries, they aim to compare themselves to those students in order to see to what extent they go through a similar education and share a similar approach to design. One of the participants, for example, says,

I took [the course] because I wanted to see how it’s like to communicate with a foreign culture, to make a project [together], to see what they do [that’s different from] what I do. [I took it] because I am curious how different cultures look at design and what they see. For example, we... Where do we stand in relation to other universities? Now for example I have an idea of where we stand in relation to [the school our team collaborated with], and [my friends in other teams] have an idea of [the school they collaborated with].
Some students even expected this course to serve as an opportunity to develop an international network among students through which they would develop long-term relations with their paired teams.

Our data reveals that at the end of the semester, when asked to reflect on their experiences in the course, students’ emphasis shifted. In their responses, their emphasis was no longer on the opportunity of cross-organizational and cross-cultural collaboration. More often, they associated their learnings with the process- rather than end-product-focused context of the course. Both the reflective essays and interviews with the members of two teams demonstrated disappointments in their communication with the paired teams. Still, as we will discuss under two separate sections below, placing the process at the core of the course seems to result in development of a number of soft skills among students, without marking these disappointments necessarily as negative experiences for themselves.

4.1 Digital Communication, Negotiation and Critiques

According to students, developing communication skills is an important outcome of the course. Among the skills they mentioned, two were prominent: skills for (1) negotiation and (2) criticizing other designers’ work.

The former is described as a skill that is related to problem solving and adopting a professional attitude. Particularly the members of the two teams who were matched with teams from the social design program mentioned the intensity of negotiation that was required throughout the process. They had problems in developing a common language, especially in the absence of face-to-face interaction, as their regular communication happened across e-mails and blogs, and with weekly virtual meetings over Skype. The major problem was, according to the students, that their paired teams did not share the same level of technical skills and knowledge due to their different backgrounds. For example, although they provided their paired teams with sketches during idea generation phase, and technical drawings, materials and manufacturing recommendations during the prototyping phase, they did not receive a parallel documentation. Although students expressed their frustration and from time to time even panicked during these phases, in the reflective essays and interviews they indicated that the negotiations required in these phases offered them a great opportunity to learn how to communicate with non-industrial designers with whom they will probably work together in professional life. One student explains below how they, as a team, learned to develop an empathetic attitude towards their paired team:

The problem at the beginning was us thinking them as [similar to] ourselves, thinking like ‘they should at least know [how to do] this’, but then when [our tutors] told us later that [we shouldn’t assume], we said, ‘yes.’ When they sent us technical drawings, we really had a laugh, like ‘is this technical drawing?’ [Our tutors] told us, ‘they sent you technical drawings, what more do you want?’ [...] Then we thought, ‘yes, it doesn’t make sense to expect from everyone to send the same thing as we ourselves do.’ Everybody has their own thing.

Another student in the same team states that such problems can be even better representing the troubles they will encounter once they start working as industrial designers. He says,

[At first], I’d seen [the course] as a really professional environment, you know, because it’s international. I mean, everything was well-organized, so when we agreed on a certain time to meet, I was expecting everyone to show a level of [professionalism]. But again, you know, it’s people. Mostly because of the people in the other team, [but also] from our own team, I saw that, um, not everyone taking it seriously to the same degree. Yet when I look back, it was good, I mean it was more realistic. Maybe if everyone was [punctual] and so on, it’d be a perfect process. Then it’d be off-putting because it’s so perfect, because it’s never like that in real life (laughs).

Thus, to the extent that students accepted this project process as a rehearsal of professional life that requires collaboration with people from other fields of expertise, they had the tendency to focus on the negotiation skills they developed. One student in the team that was matched with the team in the industrial design program compared herself to the students in the other two teams, indicating that although she finds her team “lucky” in that they had a smoother experience, she believes that other students have gained more experience in communication.

Secondly, criticizing other designers’ work was raised as another important issue regarding communication. Since during design education students are usually in the role of evaluatees, on the receiving side of critiques, they stated that for the first time in this course they had a chance to observe how their own critiques can be interpreted and responded to by other students. One student explains this as follows:
It’s good that you experience it, I mean, what the other party understands when you are giving feedback. I think this is something that we, designers, need to experience more often.

Students also underlined the significance of learning from team members during critiques. Contemplating the vocabulary, tone and attitude used by their teammates in both written and oral communication across digital media, most of the students seem to have reflected on their own communication skills. Students in the final year of their studies placed further emphasis on these skills, as they believe they will be vital in their graduation project in which they collaborate with industry and their future jobs. The below quote shows how one final year student tries to change her tone and wording in not only critiques but also in general professional communication after observing one of her teammates:

I think I was communicating a little, um, sternly in e-mails. For example, I had one of my teammates, and of course we are talking about it while writing the e-mail, ‘shall I write like this’, ‘shall we write like this’, and, um, when we received feedback from the other team, they said they really liked the language we used. Rather than ‘yes, yes, but...’, more like, ‘could we add this, too’, or ‘could it be something like this?’. I think, this sort of an approach motivates people better. It made me understand this; it developed me a lot in this respect.

To sum up, by both dealing with the problems that emerge during cross-institutional collaboration and searching for the most appropriate language for sharing their feedback on other designers’ work, students believe that they gained communication skills that will have a positive impact on their professional relations in working life.

4.2 Blogs, Documentation and Project Management

It was common among students to distinguish the design studio courses, which they describe as “end-product-focused”, from this elective course, which they identify as “process-focused”. While the aims and learning outcomes of these courses are different, they are not considered to be unconnected by the students. On the contrary, particularly third- and fourth-year students suggested that taking a course that is focused on soft skills and the process, they realized that these skills are transferable to main design studio courses to support their projects. One student, for example, says,

Actually, it wasn’t a very different process for me. You know, we do research, user research, etc. These are now the things we know from [the design studio course]. But here I saw how to apply it while realizing a product. [...] For example I noticed that normally I should apply all of such processes in our own studio [course], too. That’s what I’m trying to do now taking [the studio course]. [...] More organized... I mean how to manage my time while doing a project, how much time I need to spare for what.

In the course students keep an online design process diary in the form of a project blog through which each team gives and receives feedback, and documents all the process. Among project management skills, documentation of the whole process through the online diary was highlighted by more than half of the students. Some students retrospectively evaluated the design processes they followed in the previous years’ studio courses, indicating that they can now see how their previous projects would have benefited from keeping a design process diary. The following quote illustrates this concern:

Until this course, in design studios [of the past years], for example, it had never occurred to me to keep a list of what we do. [...] And if [the tutors asked me to], I’d think that it’s a waste of time. But after this course, it really helped me. [...] It was very good to keep the blog, to [be able to] say, ‘oh, we started from there, ended up here’. [...] I mean, to see here that design is a process with a beginning and an end, and [...] it’s not only the outcome that matters. I believe [the course] made me realize that the whole process is important.

A fourth-year student believes that keeping a project diary in this course prepared her not only for the graduation project studio, but beyond that, also convinced her about the significance of documenting whole projects from beginning to the end to ensure a well-controlled design process. She states,

I had never taken such an interactive course where so many things are left to us. Um, also, I had never written a blog. We are told that we’ll do it also at the graduation studio. I think it’s really important in that context, too, [...] because we need to document everything. I saw [at Virtual Design Studio] that if you can set up a document well at the beginning, it ends up really well.
Students suggested that documenting the whole design process is important, first, for keeping track of the reasons behind decisions, i.e. why the designer took that particular decision and why; and second, to resolve any conflict that may occur among co-workers. They indicated that particularly working with social design students, who are from a different field of design, she realized that undocumented communication is open to misunderstanding due to the lack of a common vocabulary or ways of working among various fields of design expertise. Thus, the project management skills, particularly documenting the design process, were perceived to play an important role in cross-disciplinary and cross-institutional collaboration.

5 Conclusion

Drawing on our findings, we suggest that for distributed design teams electronic communication constitutes one of the learning outcomes. As part of the changes in the role of the 21st century designer, we see the rise of distributed design collaboration and distance communication among team members. This brings a challenge for design education as it adds new types of collaborative skills to be learned by students. On the other hand, electronic communication has the potential of serving as a means for learning within design education. As our research has shown, collaborating via electronic communication tools provides students with real life experiences of collaboration, which are impractical or outright impossible in traditional settings. It also leads to self-learning of soft skills necessary for managing interpersonal relations in teams, distributed or otherwise. In this sense, electronic communication offers opportunities for design education at large.

We started this paper with the aim of exploring how and in what ways pursuing a process-focused design studio provides industrial students with a different learning experience compared to their previous experiences in traditionally end-product-focused design studio courses. This question was triggered by our observation that in design literature while there are various sources on teaching and learning of technical skills of designers, there is a tendency to disregard the question of how to integrate soft skills into design education. Drawing on our findings, we assert that rather than expecting students to develop their soft skills on their own during their design education, we should design process-oriented courses with explicit learning outcomes, classroom discussions and assessments that are concerned specifically with the targeted soft skills. On the other hand, while we have been interested in soft skills during the course, we can presume that a process-oriented educational approach could be equally beneficial in the teaching of technical skills, such as idea generation, material selection, user testing etc. In Virtual Design Studio, we observed the value of classroom discussions in which we discussed with students about their problems in communication, teamwork, delivery and timetabling. Our findings indicate that these discussions helped them to reflect on their attitudes and approaches, as well as the methods they adopted in their responses to these problems. Moreover, teams suggested various strategies to each other for handling the problems they encountered, so we can suggest that, when openly shared in the classroom, students can also learn from others’ experiences.

Confirming the argument highlighted in the existing literature that electronic communication is more complicated and requires additional strategies in comparison with face-to-face communication in collaborative design work, our study reveals how these challenging collaboration processes can also function as unique learning opportunities in design education. We conclude that communication and collaboration problems in a design project should not be avoided, but rather be designed into the process as part of the learning outcomes of the course.

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