



The Design Journal

An International Journal for All Aspects of Design

ISSN: 1460-6925 (Print) 1756-3062 (Online) Journal homepage: <https://www.tandfonline.com/loi/rfdj20>

Facebook as a Boundary Object in Industrial Design Studio. A SoTL Study

Işıl Oygür & Selen Devrim Ülkebaş

To cite this article: Işıl Oygür & Selen Devrim Ülkebaş (2017) Facebook as a Boundary Object in Industrial Design Studio. A SoTL Study, The Design Journal, 20:sup1, S1037-S1047, DOI: [10.1080/14606925.2017.1353047](https://doi.org/10.1080/14606925.2017.1353047)

To link to this article: <https://doi.org/10.1080/14606925.2017.1353047>



© 2017 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group



Published online: 06 Sep 2017.



Submit your article to this journal [↗](#)



Article views: 117



View related articles [↗](#)



View Crossmark data [↗](#)

Facebook as a Boundary Object in Industrial Design Studio. A SoTL Study

Işıl Oygür^{a*}, Selen Devrim Ülkebaş^b

^a Özyeğin University

^b Kadir Has University

*Corresponding author e-mail: isil.oygur@ozyegin.edu.tr

Abstract: We introduced Facebook groups as instructional tools in our industrial design studio courses. One of us experienced the effects of Facebook on freshmen while the other examined it with sophomores and juniors. Our analysis of the data focused on the content of students' posts on Facebook groups, informal student interviews, our experiences in studios, and our reflective cross-evaluation. Our comparative analysis showed that Facebook better serves as a boundary object in the later years of design education. The freshmen, and partly sophomore, were not able to make effective use of this medium for exchanging knowledge. From the perspective of SoTL, this study not only helped us to experiment ways of advancing our pedagogy but also served as a platform for us to discuss and exchange knowledge on teaching and learning that is taking place in studio.

Keywords: Scholarship of teaching and learning, Pedagogy, Social networking, Boundary object, Design studio

1. Introduction

Since Boyer's (1997) critique of traditional American higher-education system's approach to scholarship, the scholarship of teaching and learning (SoTL) has gained increased significance worldwide. It is believed that SoTL "... has the potential to transform higher education by making the private work of the classroom visible, talked about, studied, built upon, and valued..." (Huber and Hutchings, 2005, p.ix).

These qualities of SoTL have a lot to offer for industrial design pedagogy. Industrial design education has been criticized for not being able to meet the needs of contemporary knowledge society (Norman 2010; Findeli 2001). SoTL opens a new platform for industrial design educators to critique, share, discuss, and restructure their teaching and students' learning in order meet the contemporary needs. This is also what we aimed in this paper. We share our experience on introducing Facebook groups in first three years of industrial design studios. There are several resources focusing on the impact of social network sites on education in general and design education in particular.

However, to our best knowledge, studies examining the pedagogical capabilities of Facebook across different years of industrial design studio education are very limited. This paper focuses on this gap and tries to address the research question of: “What is the impact of Facebook groups as a boundary object on teaching and learning in industrial design studios?”

2. Design and Pedagogy

2.1 Scholarship of Teaching and Learning in Relation to Industrial Design

Quite often, educators plan and practice teaching in their own silos with limited interaction with colleagues. Despite the amount of time spent on such affords, it has not always been acknowledged as a scholarship by higher-education institutions and local and global academic associations. The scholarship of teaching and learning (SoTL) has grown as a reaction to this limited approach to teaching (Boyer, 1997; McKinney, 2007).

The practice of SoTL has a wide range of applications from courses and assignments to programs and curriculum (Schulman, 1998). In either case, the aim is the improvement on student learning through developments in teaching. In this sense, SoTL is action oriented. Meeting this goal requires critical approach and scholarly inquiry into ones’ teaching and students’ learning (Hutchings, Huber, & Ciccone, 2011). Educators use a variety of research approaches and research methods in this process. According to Weimer’s (2006) review of the field, there are qualitative, quantitative, and descriptive studies as well as texts that rely on intuitive analyses. Weimer also defines some studies as “promising possibilities” as they involve a unique approach to common research methodologies.

Independent from the methods used by educators, at the very core, SoTL requires educators to share their evidence in order to build collective knowledge on teaching and learning. Hutchings, Huber & Ciccone (2011) call the venues for knowledge exchange as “teaching commons” (p.2). This is “... a space in which communities of educators committed to pedagogical inquiry and innovation come together to exchange ideas about teaching and learning and use them to meet the challenges of educating students for personal, professional, and civic life” (Hutchings et al., 2011, p.2).

This knowledge and innovation oriented approach to teaching and learning offers a very valuable perspective for industrial design. Industrial design education initially took place in the apprentice tradition of the art and craft guilds. Design became part of the university education only during the past half-century, as a consequence of a shift from industrial economy to knowledge oriented post-industrial economy (Friedman, 2000, 2002). The transition towards information society and knowledge economy has created new needs, necessities and methods for industrial design profession to adopt. Yet, contemporary design pedagogy is still based on Bauhaus school, which has a major influence on design schools worldwide (Efland, 1990), and industrial design education has been blamed for not being able to make the transition to meet the needs of knowledge society (Findeli 2001; Friedman, 2000, 2002; Giard 1990; Norman 2010). Skill-based education is no longer sufficient and valid for the contemporary industrial design practice. Despite the significance of reconsidering industrial design education, SoTL studies in relation to industrial design are very limited. The focus is mostly on educational research. However, in this knowledge society, making teaching experiences public in order to build collective knowledge on ways to advance student learning through teaching is necessary.

2.2 Interacting with New Generation Students

Today, teaching new generations, millennials, bring new challenges for educators. Majority of the current design students are from “millennial generation”, namely “net generation”, “generation y”, “digital natives”, “echo booms”. There is not consensus on the name or the age range of these young individuals. Yet, there are several common characteristics of this generation (Berk, 2009). Millennials, are known for their confidence, technology-savviness, active learning, and multi-tasking. They take interactivity and easy accessibility for granted. All these characteristics are results of some technological, economic, social, and cultural developments that they have witnessed.

Developments on communication technologies (i.e., personal computers, World Wide Web, mobile phones) in the 80s and 90s have dramatically changed every aspect of life by enhancing mass movement of knowledge. Yet, this transformation cannot be limited to enhancements enabled by new technological tools. It has changed how people perceive and respond to the world around them. Millennials are the first generation who was born into this transition and therefore shaped by it. They are a milestone for understanding changing patterns of knowledge and learning.

Millennials’ new “competences”; accessibility, interactivity, communication, collaboration, networking, immediacy, and multitasking, resulted them to have different perspectives, values, perceptions, attitudes, practices and even more importantly, different thinking patterns, acquisition and process of knowledge than their former generations (Cornu, 2011). Their short attention span, difficulties with hierarchy, time constraints, processes, control and task-sharing, caused them to prefer learning through visually represented knowledge along with interactivity and games, rely on information gained from digital platforms. Empirical and demonstrative ways of learning within a collective and networked activity suit with their competences.

These qualities of millennials bring new challenges for educators who are from former generations with different characteristics; Baby Boomers and Generation X. There is a need for building new pedagogical strategies which are coherent with the changing aspects of knowledge and learning patterns of millennials. Moreover, these strategies should not be limited to technologization of education or using digital platforms for transferring traditional methods and sources. In this context, social network platforms can be a significant option for enhancing teaching and learning.

2.3 Social Media as a Pedagogical Tool for Design Studio Courses

Design studio courses can be defined as the core of industrial design curriculum. Unlike the lecture courses, studio courses base on social and collaborative learning situation in studio environment. However, studio is not just a physical space. Its importance for design pedagogy relies on studio as a social space of participation, interaction and active learning process. Besides the interaction during the class hours, open and permanent studio environment is also important as it enables students to work interactively without time restriction.

Donald Schön (1987) puts the characteristics of the design studio as “learning-by-doing” and “reflection-in-action”. Constant iterative cycle of proposing ideas in project critiques, getting feedback from instructor and peers, and reflecting them to build subsequent design decisions are essential for design studio pedagogy (Shaffer, 2007). Dialogs between instructor-student and student-student enable not only formal interaction, but also social. Instructor aims to create a reflection about design thinking and design process. Therefore, the essence of design knowledge is participation, interaction, co-construction in a hands-on ongoing iterative process.

Today, interaction modes and spaces have been integrated with digital devices and platforms. This transition has led some scholars to search new ways to enhance participation and interaction in courses. While the educational value of social networking sites has been area of debate (Hew, 2011), each member has the possibility to access, contribute and collaborate independent from time and space. This provides an open environment for different parties to exchange knowledge digitally. In terms of studying the dynamics of knowledge exchange, different theories provide different perspectives. One such theory is boundary objects. The term “boundary object” was coined by Star and Griesemer (1989) in their sociological study of a natural history museum. They defined boundary objects as the tangible and intangible objects that aid in communication among parties. These are malleable objects to meet the epistemic needs of each party while still creating a common ground where different parties can interact and unite. This framework has been adopted by design scholars working on design process (e.g., Bertelsen, 2000; Bødker, 1998; Fischer & Ostwald, 2005; Fleischmann, 2006). It can also be helpful to evaluate the interaction between educators and students in setting where social networking sites were used as instructional tools.

3. Methodology

In order to study our research question, we introduced Facebook groups as an instructional tool in our industrial design studio courses. Facebook is specifically selected as it is the most popular social networking platform with an average of 1.18 billion daily active users as of September 2016 (FB, 2016).

New Facebook accounts were created specific for this study. This was found crucial in order to develop a more formal approach and to protect the privacy of the instructors and students. The secret Facebook pages were created prior to the semester and introduced on the first day of class. One of us experienced the effects of Facebook on freshmen while the other examined it on sophomores and juniors. As we were working at different universities, the studio courses were offered at two private foundation universities from Istanbul.

Throughout the semester, Facebook was utilized for exchanging visual and verbal information. Both parties, instructors and students, were expected to share posts in the groups. Project related images (e.g., exemplary work, useful links related to course content or weekly assignments) were specifically posted on the page. However, students were encouraged to post non-project related inspirational information and design news. In order to encourage knowledge-exchange, we followed the posts and provided necessary replies. There were occasions in which students made replies to each other’s posts as well.

The research was structured as a qualitative study. In addition to Facebook posts, we utilized informal interviews with students and reflective diaries as data collection tools. As two instructors, we had discussion sessions throughout the semester in order to exchange experiences. These sessions also served as venues to analyse our experience. Thus, data collection and analysis took place simultaneously.

By the end of the semester, we had four main data resources: Facebook posts (see Table 1 for the relevant numeric information), informal interview notes, reflective diaries, and cross-evaluation discussion notes. For the final analysis phase, we reviewed Facebook posts in terms of content and

used constant comparative method as defined by Thomas (2013) to make sense of the data. This involved coding the students' posts in order to classify the topics of discussion on each Facebook page. We utilized descriptive statistics in this process and calculated the percentages for each topic.

Table 1. Number of posts on each Facebook group

	Number of students registered to page	Total number of posts on the page	Number of student posts	Number of instructor posts
Freshman	29	103	68	35
Sophomore	12	32	12	20
Junior	21	79	43	36

4. Three studios, three experiences

In all three studio courses, instructors served as mediators of the design process. Projects were introduced via a project brief. Instructors gave individual critiques to each student during course hours. Students were expected to follow a prototypical design process starting with research and continuing with ideation, design development, and refinement.

4.1 First year design studio

First year design studio focused on communicating the elements and principles of design. The class met for two four-hour sessions every week. Students work on different assignments each week. Course hours are utilized both for working on assignments and discussing student submissions. There were also short presentations introducing principles of design over examples.

In order to better accommodate Facebook page to the structure of the course, students were given three assignments. These assignments asked students to 1) make an analysis of a visual art object, 2) make an analysis of a product, and 3) make an analysis of how design applies to everyday life. Students were notified that they would receive additional points for their assignment posts.

Not all students actively involved in the Facebook group. 34% of the posts were from instructors. This number is very high and illustrates the limited participation from students. Among 68 student posts, 51 were related to assignments. These posts were the only ones that involved student's interpretation. They were all positive. Although students complained about the workload over the semester, they did not reflect these thoughts on the page. Instead, students' statements included sentences like "I strongly believe that this course was useful in terms of finding our own answers through discussion."

Students' posts other than the assignment posts (17 posts) can be classified under 4 topics: *Information about Design Issues in General (65%), Announcements/Events (18%), Information about Project Topics (6%), and Questions about Project (12%)*. These posts included links to websites (53%), photographs (17%), videos (17%), and text (12%). Students rarely included additional text in their posts and replied to each other's posts (except 1-2 occasions).

By the end of the semester, one student explained that she initially found the Facebook page as a ridiculous requirement. However, her idea changed over the semester as she found the instructor's information and inspirational links useful while working on her assignments. Another student

suggested using Pinterest instead of Facebook. While it would not be possible to make comments on Pinterest, she thought that it would be possible to conduct research easier.

Students taking this course in earlier years mentioned that they had created an internal Facebook group for the course to discuss course related topics, especially assignments. When the Facebook group was created as an instructional tool for this course, it was observed that, rather than using Facebook page as a discussion board, students moved to another platform (i.e., Whatsapp).

4.2 Second year design studio

Second year design studio aims at introducing the core issues of product design; defining the design problem, user needs, concept and design criteria development, analysis on structure, materials and production details, presentation techniques, through short hands on exercises. The course is finalized with one project cultivating the abilities gained throughout the semester.

Total number of posts inside the second year design studio private Facebook group is 32. 20 of these from instructor and 12 is from students. 91% of the posts were seen by all 12 students. Post topics can be categorized as *Information about Design Issues in General*, *Information about Project Topics*, *Notification about Project*, *Questions about Project*, and *Social Interaction-Project Process Moments*.

Sophomores' post topics mostly focus on *Social Interaction* (33%) which is followed by *Questions about Project* (25%), *Information about Project Topics* (25%) and *Information about Design Issues in General* (17%). Sophomores preferred sharing knowledge/information mostly through photographs (33%) as communication media, which is followed by web page links (25%), text (25%) and video (17%). They preferred web page link and video for sharing *Information about Design Issues in General* and *Information about Project Topics*; text for asking *Questions about Project* and photograph for *Social Interaction*, namely for sharing project process moments. They usually did not prefer including any additional comment or explanations to their posts and rarely commented on their peers' posts, instead they preferred "like" button for responding to these posts (73 likes). Few amounts of comments (10) were mostly on *Information about Design Issues in General* and *Social Interaction* post topics. Sophomores mostly "liked" posts on *Information about Design Issues in General* and *Information about Project Topics*.

Students' engagement to the group was limited to sharing links to web sites and photographs that they found useful for the course. Although, instructor encouraged students to share their project process and create an online project critique session, none of the students preferred sharing their progress. Some of them stated their concern about possibility of "unwanted" inspirations from their ideas by their peers. Yet, some students preferred continuing critique process by sending photographs of their sketches and mock-ups through email. Almost all students stated that they took advantage of this online interaction due to its instant and easy access; getting in touch with peers and instructor in order to get information about project and assignments, and get informed about the recent developments through the share of events, news and examples on design.

4.3 Third year design studio

Third year design studio aims to bring together the experiences of the first four terms and applies them to a prescribed comprehensive design project. Course hours are utilized for maintaining effective and more methodological creative problem solving processes. The course also undertakes a

broader understanding of design through developing marketing and systems thinking skills. The class met for two four-hour sessions every week.

Most of the juniors actively involved in the Facebook group. Total number of posts is 79. 39 of these are from the instructor and 43 is from students. 80% of the posts were seen by all 21 students.

In third year design studio, a sixth post topic category (i.e., *Critique of Project/Instructor*) emerged from the posts. Juniors' post topics mostly focus on *Social Interaction* (56%), *Information about Project Topics* (14%), *Critique of Project/Instructor* (12%), *Questions about Project* (9%) and *Information about Design Issues in General* (9%). Juniors preferred sharing knowledge/information mostly through photograph (74%) as communication media, which is followed by text (14%), video (9%) and web page (2%). They preferred photograph, video and web page links for posts on *Information about Design Issues in General*; photograph, text and video for sharing *Information about Project Topics*; text for *Questions about Project*; photograph for *Social Interaction*; photograph, text and video for *Critique of Project/Instructor*. With 33 comments, juniors were more active on commenting to their peers' and instructor's posts compared to sophomores. Juniors preferred commenting on their peers' posts mostly on *Information about Design Issues in General*, *Social Interaction*, *Questions and Notification about Project*. Yet, they also preferred "like" button for responding to the posts (121 likes). They mostly "liked" posts on *Critique of Project/Instructor*, followed by *Notification about Project*, *Information about Project Topics*, *Social Interaction*, *Questions about Project* and *Information about Design Issues in General*.

Compared to sophomores, juniors more actively engaged to the interaction in the group. Yet, once more students were reluctant towards instructor's encouragement of sharing project process and creating an online project critique session. Although, students were first thrilled about this opportunity, they never shared their design process online. Some students stated that they needed more well defined and structured platform for online project critique session, and they did not convince that everyone is going to share their projects and in this case they were reluctant to come forward and be first to present their works online. Yet again, some students preferred continuing critique process by sending photographs of their sketches and mock-ups through email.

However, they actively used Facebook group as a social interaction environment for sharing their opinions, feelings and decisions related mostly to project, but also to progress of the project critiques and design issues in general. Finally, they stated that use of this technological communication platform made them feel more close to design studio course and more informal platform of interaction made them feel confident within their dialogue with instructor. At the end of the semester they congratulated each other and instructor for having such a productive and enjoyable studio process.

5. Discussion

The findings from three design studio experiences can be evaluated based on two issues: the use of Facebook as a pedagogical tool in industrial design studio and the SoTL's contribution to industrial design pedagogy.

When the average of student posts is compared (2.4, 1, 2.1, in respective order), the findings give the impression that the first year students are the most active ones. This might not reflect the reality as

there were three assignments that required first year students to make posts. There were only 17 posts that were not related to assignments. This makes the average of student posts, which were made by student's own will, 0.6. Also, the ratio of students' posts to instructors' posts are 1.9 (when the number of posts made by student's own will are considered, this number is 0.5), 0.6, 1.3, in respective order. These numbers show that the third year students were the most active ones on Facebook. In terms of the number of student posts and their content, freshmen trial was evaluated as not being able to reach its goal properly, and sophomores partially. It can be interpreted that for the first and second year studios, knowledge exchange through Facebook was mostly uni-directional, from instructors to students. Thus, as a boundary object Facebook was most effective in the third year. Juniors made use of this instant and easy accessed interaction and communication between instructor and students in an open environment free from time and space restriction. This platform made them feel more close to design studio course and more informal platform of interaction made them feel confident within their dialogue with instructor.

Schön (1987) puts the characteristics of the design studio as "learning-by-doing" and "reflection-in-action". Thus, design knowledge is built through participation, interaction, co-construction of both instructors and students. This partnership between instructor-to-student and student-to-student enables design knowledge to emerge. Studio is not just a physical space. Its importance for design pedagogy relies on its feature of being a social space of participation and interaction. Our experience showed that traditional understanding of studio as a physical space can be enhanced by a digital interaction that is free from space and time restrictions. However, the freshmen, and partly sophomore, were not able to make effective use of this digital medium for exchanging knowledge. In this sense, in the early years of industrial design education, Facebook loses one of its most significant qualities, being a digital environment for social interaction. Yet, it seems that students label Facebook as informal and personal social interaction and in studio socialization as more formal one. Juniors who have already built a social dialogue with their peers and instructors, and also are more confident about their knowledge on design issues, actively used Facebook as a medium for exchanging knowledge and interaction (Table 2).

Table 2. Topic and content of students' posts across years

	First year design studio	Second year design studio	Third year design studio
Topics of student posts	<ul style="list-style-type: none"> •Information about design issues in general (65%) •Announcements/events (18%) •Information about project topics (6%) •Questions about project (12%) 	<ul style="list-style-type: none"> •Social interaction (33%) •Questions about project (25%) •Information about project Topics (25%) •Information about design issues in general (17%) 	<ul style="list-style-type: none"> •Social interaction (56%) •Information about project topics (14%) •Critique of project/instructor (12%) •Questions about project (9%) •Information about design issues in general (9%)
Content of student posts	<ul style="list-style-type: none"> •Web page links (53%) •Photographs (17%) •Videos (17%) •Text (12%) 	<ul style="list-style-type: none"> •Photographs (33%) •Web page links (25%) •Text (25%) •Video (17%) 	<ul style="list-style-type: none"> •Photograph (74%) •Text (14%) •Video (9%) •Web page links (2%)

The Facebook assignments in the first year were given to encourage students to utilize Facebook as a venue for knowledge exchange. However, it was observed that these assignments had a negative impact on the use of Facebook as a social environment. Students evaluated Facebook as a tool for meeting course requirements and moved to another platform to carry their own conversation. For the first year, this showed that students are not feeling comfortable with carrying all the discussion in front of the instructors.

Second and third year students were open to use digital platforms for project critiques. Thus, most of them used email for project critiques by sending photographs of their sketches and mock-ups. However, Facebook is not well equipped for the iterative cycle of ongoing project critiques. As students stated a better-defined and structured platform is needed for online project critique sessions.

In terms of the impact of Facebook, all these findings support Hew's (2011) argument regarding the inconsistent value of Facebook as a pedagogical tool. However, in terms of SoTL's contribution, this study shows the positive contribution of SoTL to industrial design pedagogy. In addition to two of us, our colleagues also heard about our trial and occasionally joined our conversations. This enabled us to develop our own teaching commons as defined by Hutchings et al. (2011).

The comparative analysis of our findings across years made us critique our own pedagogy. It also helped us to assess what to improve on the next trial. Without sharing our findings with each other, we would not have the chance to evaluate our teaching and students' learning as much as we did. We now believe more on Huber and Hutchings' (2005) comments regarding the value of sharing classroom experiences so that others' can build upon. Such approach is especially important for young educators who generally seek guidance.

6. Conclusion

As industrial design instructors, we spend a major amount of time at studios and classrooms trying to exchange knowledge with millennials. Despite our efforts and commitment, teaching is not always assessed as an intellectual activity that can be approached from a research perspective (Boyer, 1997; Hutchings et al., 2011). In this paper, we challenged this attitude following SoTL's framework. Most of the core competences of millennials are in line with the core features of design studios; interaction, communication, practice based, demonstrative and visual. Moreover, regarding the change in physical landscape of space, artefacts, knowledge and modes of people interaction in the new realm of life, adapting design pedagogy to the digital platforms will be beneficial for design studio courses. Therefore, we experimented Facebook as a boundary objects in the first three years of industrial design studio. Our comparative analysis of the impact of Facebook in the first three years of industrial design studio education showed that Facebook better serves as a boundary object in the later years of design education. Yet, Facebook does not serve for knowledge exchange, interaction and collaboration at project critiques level. Features of Facebook does not answer to this systematic ongoing iterative process of design studio.

Third year students actively made use of Facebook as knowledge exchange and social interaction. However, instructors have to give an emphasis on building more open and friendly interaction environment in order to encourage freshmen and partly sophomores for interaction. Especially,

freshmen have loose social dialogue with their peers and instructors, and they are less confident about their knowledge on design issues.

From the perspective of SoTL, this study not only helped us to experiment ways of advancing our pedagogy but also served as a platform for us to discuss and exchange knowledge on teaching and learning that is taking place in studio. We were motivated about being able to approach teaching as a research and learn from each other's experience. While the findings from this study might be hard to generalize, we believe they illustrate the potential contribution of SoTL to industrial design educators.

References

- Berk, R. A. (2009). Teaching strategies for the next generation. *Transformative Dialogue: Teaching & Learning Journal*, 3, 25-48.
- Bertelsen, O. W. (2000). Design artifacts: towards a design-oriented epistemology. *Scandinavian Journal of Information Systems*, 12, 15–28.
- Boyer, E. (1997). *Scholarship reconsidered: priorities of the professoriate*. SF: Jossey-Bass.
- Bødker, S. (1998). Understanding representation in design. *Human-Computer Interaction*, 13(2), 107–125.
- Cornu, B. (2011). *Digital Natives: How Do They Learn? How to Teach Them?* UNESCO Institute for Information Technology in Education Policy Brief, September 2011
- Efland, A. (1990). *A History of Art Education: intellectual and visual currents in teaching the visual arts*. Teachers College Press.
- FB (2016). Retrieved November 10, 2016, from <https://newsroom.fb.com/company-info/>.
- Findeli, A. (2001). Rethinking design education for the 21st century: theoretical, methodological, and ethical discussion. *Design Issues*, 17(1), 5–17.
- Fischer, G., & Ostwald, J. (2005). Knowledge communication in design communities. In R. Bromme, F. W. Hesse, & H. Spada (Eds.), *Barriers and biases in computer-mediated knowledge communication, computer-supported collaborative learning series* (Vol. 5, pp. 213–242). Springer US.
- Fleischmann, K. R. (2006). Boundary objects with agency: a method for studying the design–use interface. *The Information Society*, 22(2), 77–87.
- Friedman, K. (2000). Creating design knowledge: from research to practice. Paper presented at IDATER 2000 Conference, Loughborough, UK. Retrieved June 10, 2011, from <https://dspace.lboro.ac.uk/dspace-jspui/bitstream/2134/1360/1/Friedman2000.pdf>
- Friedman, K. (2002). Design Curriculum Challenges for Today's University, *International CLTAD Conference on Enhancing Curricula: Exploring Effective Curricula Practices in Art, and Communication in Higher Education*, London, 28, 27-63.
- Giard, J. R. (1990). Design education in crisis: the transition from skills to knowledge. *Design Issues*, 7(1), 23–28.
- Hew, K. F. (2011). Students' and teachers' use of Facebook. *Computers in Human Behavior*, 27(2), 662–676.
- Huber, M. & Hutchings, P. (2005). *The Advancement of learning: building the teaching commons*. San Francisco, CA: Jossey-Bass.
- Hutchings, P., Huber, M. T., & Ciccone, A. (2011). *The scholarship of teaching and learning reconsidered: institutional integration and impact*. San Francisco, CA: Jossey-Bass.
- McKinney, K. (2007). *Enhancing learning through the scholarship of teaching and learning: the challenges and joys of juggling*. Bolton, Mass: Anker Pub.

- Norman, D. (2010). Why design education must change. Core77. Retrieved June 18, 2015 from <http://www.core77.com//posts/17993/Why-Design-Education-Must-Change>.
- Schön, D. A. (1987). *Educating the reflective practitioner: Toward a new design for teaching and learning in the professions*. San Francisco: Jossey- Bass.
- Shaffer, D. W. (2007). Learning in design. In R.A. Lesh, J.J. Kaput & E. Hamilton (eds.), *Foundations for the future in mathematics education* (pp. 99-126). Mahwah, NJ: Lawrence Erlbaum.
- Star, S. & Griesemer, J. (1989). Institutional ecology, 'translations' and boundary objects: amateurs and professionals in Berkeley's Museum of Vertebrate Zoology, 1907-39. *Social Studies of Science*, 19(3), 387–420.
- Thomas, G. (2013). *How to do your research project: a guide for students in education and applied social science*. Los Angeles: SAGE.
- Weimer, M. (2006). *Enhancing scholarly work on teaching and learning: professional literature that makes a difference*. San Francisco: Jossey-Bass.

About the Authors:

Işıl Oygür, PhD, is an assistant professor of industrial design at Özyeğin University, Turkey. She holds a doctoral degree from Washington State University, USA and a Master of Science degree from İstanbul Technical University. Her research interests include design research, design anthropology, user-centered design, and the scholarship of teaching and learning in design.

Selen Devrim Ülkebaş, PhD, is an assistant professor of industrial design at Kadir Has University. She earned PhD in 2012 from İstanbul Technical University where also gained MSc in Industrial Product Design and BSc in architecture. Her research interests focus on design anthropology, sociology of consumption, practice theory, design for behaviour change, material culture and product semantics