

WE NEED TO TALK ABOUT IT – PLACING DIALOGUE AT THE CENTRE OF DESIGN EDUCATION

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ABSTRACT

This paper presents a model of teacher-student one-on-one interaction in the design studio we termed design conversations. The purpose of this paper is to describe guidelines for novice studio teachers and also to present a tool for experienced teachers to self-monitor their teaching practice. Furthermore, the paper provides design researchers interested in conducting empirical studies in the design studio with a model of what to expect in the field. Finally, the paper aims to contribute to the field of design education by describing its specific educational setting (the design studio) with its own terms and definitions.

Keywords: Design education, design studio, teacher-student dialogue

1 INTRODUCTION

The model for design education is the design studio, an educational setting where students practice designing under the supervision of a teacher. In this setting, one-on-one meetings between teacher and student take centre stage.

An often-overlooked aspect of these meetings is that they are a conversation – a close and personal dialogue about the student’s unfolding design project. While student activity in the studio can be considered another form of design practice (or a simulation of professional design) the dialogue between teacher and student is a particular aspect of design education. Note that, in their everyday professional practice, designers do not usually talk about their design process, and when they do, it is often in mystifying terms. As it happens, knowledge about the design process is often described as tacit, implicit, intangible, and hard to be known, and so on. On the contrary, the studio places the teacher in the position of having to make the process of designing clear and explicit for the student. Thus, knowledge about design naturally emerges from the conversation with the students.

Often short and spontaneous, these everyday conversations form the backbone of the teaching/learning process in the studio. One by one, each conversation adds to the student’s growing experience with the design process. Countless meetings in numerous design schools take place across the world every day, which makes the purely evaluative moments (final or intermediary project presentations) the exception in the otherwise tutorial-based activity of the studio. This means that design pedagogy is process-oriented and not product-oriented since the purpose is to learn from the experience of designing.

Therefore, dialogue in the design studio forms a formative-evaluative continuum where learning and evaluation happen simultaneously with each conversation. This teaching/learning process is becoming quaint in the current day metric-focused university. As such, while the pedagogical underpinnings of the design studio are valuable and unique, they are not immediately obvious to an outside observer. If the design community wishes to preserve its natural instructional setting, then we must be clear about what makes it valuable by studying and defining it in its own terms.

In this paper, we present a model of teacher-student one on one interaction in the design studio that we call *design conversations*. The model can be useful for novice studio teachers by providing guidelines of what to expect and also to self-monitor their teaching practice (in the latter sense it is also useful for experienced design teachers); finally, the model can also be beneficial for design researchers interested in conducting much-needed empirical research on the design studio.

2 PROVIDING A MEANINGFUL LEARNING EXPERIENCE

The design studio can be described as an experience-based and hands-on approach to learning where students experience a simulation of a real-world problem. This description is consistent with the constructivist learning theories that influence pedagogical discussions to this day [1]. For this paper, we will concentrate on how the foundational authors of constructivism (Dewey, Piaget, and Vygotsky) described a meaningful learning experience.

For Dewey [2], learning occurs through experience and requires practical problem-solving and reflection. According to the American philosopher, knowledge is hard-won by engaging with a problem and experienced first psychologically and only later organised logically. Dewey compares the experience of the learner to an explorer mapping a new territory; the explorer (much like a designer setting out on a new project) does not know the terrain that lies ahead, he has to come across mountains, deserts, and uncharted waters and to overcome many hardships before his journey is over and the new territory is known. This description is consistent with Schön's [3] statement that design students do not know how to design until they do it themselves, and therefore, to design is to set out on unknown territory.

The process of learning is thus explorative, personal, and based on experience. Dewey's emphasis on exploration and the psychological importance of experiencing a new real-world problem is shared with Piaget's [4] view that exploration is a requisite for the construction of personal knowledge. Piaget describes learning as a process in which people construct an understanding of the world, identify inconsistencies between what they know and what they discover through experience, and adjust their ideas accordingly. Underpinning these ideas, is the notion that there is no linear knowledge transfer between two individuals; according to Piaget, to acquire new knowledge the individual must experience a situation of unbalance between new information and pre-existent personal knowledge structures.

It is interesting to observe that, in the context of a design studio, there is *indeterminacy* built-in to the natural unfolding of the tutorial between teacher and student. Notice that the design project functions as the anchor that grounds the teacher and student attention in a practical dialogue. A design conversation entails a back-and-forth personal interaction between the participants, an explorative dialogue that has neither a predetermined duration nor a clear outcome. Because it is concentrated on the student's project, the dialogue is to a large degree indeterminate. There are no obvious outcomes to a design conversation, and even a more formal review may unfold in unexpected directions. This is so because a design project describes an ill-defined design situation, that is, the student's ideas express a temporary balance between the project's constraints and the student's proposed solutions to tackle them. In other words, problem and solution co-evolve [5] in a progressive manner, a proposed solution may have an effect on the situation's constraints and lead to altering them, and likewise, a reformulation of a constraint may result in a satisfactory design solution.

The design studio also has the necessary conditions to establish what Vygotsky called the Zone of Proximal Development [6], which can be described as the difference between what a person already knows and the potential that a person can reach under the guidance of either a teacher or in close collaboration with more experienced peers. Consider a novice student's attempts to design while a more experienced teacher offers guidance and support. Also, in the design studio, students will vary in their ability to design, which means that students also learn from each other in a similar dynamic to the one established with the teacher, but to a lesser degree since the knowledge difference between teacher and student is expected to be higher than between students. Nevertheless, Vygotsky's emphasis on the surrounding environment and the author's description of learning from the interaction with others is an apt description of the significant social component of a design studio classroom [7].

However, while constructivist ideas can generally describe the activity of the design studio, they are not a direct influence on its structure or functioning. In fact, the design studio setting was already established before the theory of constructivism was formulated; the studio setting emerged from the necessity of training craftsmen in guilds in middle-age Europe [8] and developed through the years without much alteration to its fundamental master-journeyman-apprentice dynamics until it was adopted by universities as the preferred way to teach design students.

2.1 A coherent educational setting

The design studio model of education is a practical learning setting closely connected to the practice of design. In fact, the ways of thinking in design, (design thinking) and the process of teaching this way

of thinking (the learning of how to design) form a coherent system [9] [10]. In other words, the praxis (design practice) epistemology (designerly ways of knowing [11]) and pedagogy (learning how to design) of design are adapted to each other.

Therefore, we can say that design studio is a type of signature pedagogy [12]. Signature pedagogies are forms of instruction in which the pedagogical practice bears the *signature* of the professional discipline, that is, when the teaching and learning process is a simulation that embodies the central aspects of the discipline it is preparing its students to enter into. Schön [13] noted that the design studio was so unique and rich in learning potential that other academic disciplines would do well to integrate some of its principles in their teaching processes.

2.2 Lack of studies

And yet, there is a considerable lack of studies that focus on real-context teacher-student interactions in a design studio setting. This situation is surprising if we consider the consensus, in design research, that the design studio setting is the fundamental aspect of design education [14] [15] [16]. However, it is also widely recognised that there is an incomplete understanding of how the teaching/learning process in the design studio unfolds, and it is precisely the teacher-student interaction – the crucial feature of the design studio – that lacks closer examination.

One consequence of a lack of a description of the design studio setting is that there are few pedagogical guidelines available for novice studio teachers. Therefore, inexperienced design tutors will inevitably struggle when first entering the design studio. The design studio setting is problematic for the everyday practice of teachers (novice and experienced alike) since the effectiveness of the teaching/learning process greatly depends on the personal interaction between teacher and student.

As such, in this paper we propose a descriptive model of teacher/student interaction that can provide design teachers with a general description of the essential features of design studio interaction.

3 DESIGN CONVERSATIONS

Design conversations are the instances of one-on-one dialogue between a teacher and a student while presenting, reviewing, or working on a design project. Donald Schön [3] described these close interactions as an apprenticeship, a dialogue that takes place in a simulation of real design practice; a shared ‘virtual world’ that the student explores under the guidance of a teacher.

Each design conversation is – by nature – unique, but it also takes place in a format in which the fundamental premises are the same: teacher and student discussing the design project in a conversation mediated by visual design representations (VDRs). While dialogue is the natural centre of a design conversation, the presence of the third element, the VDRs, impacts the conversation in the following way: (1) VDRs are the ‘material’ with which teacher and student work during the interaction, (2) they reveal the development of the student’s project; (3) VDRs disclose aspects of the student’s thinking and design process; and (4) visual representations establish a shared virtual setting between teacher and student – a frame – which functions as a laboratory for experimentation.

In this section of the paper we will focus on how the dynamics between the three elements of design conversations elicit a dialogue with high potential for design learning (particularly the tacit knowledge of design [17] [18]). The diagram below succinctly illustrates how the different elements interact.

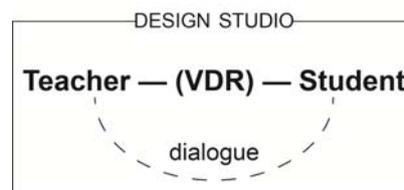


Figure 1. Design conversations model

3.1 Visual design representations

VDRs are the depictions of a design situation used by designers while working on a project. In practical terms, VDRs are the sketches, drawings, physical and virtual models, diagrams, and any other media used to express, communicate, explore, and examine the elements of a design situation; Lawson [19] summarises VDRs as the “ways of representing design situations.” (p.293). VDRs can be

placed on a spectrum from early depictions of explorative ideas (sketches) to highly technical and accurate descriptions of the final design (prototypes) [20].

The purpose of VDRs is, firstly, to visualise, communicate, and store information; but a VDRs also serves both to externalise thought and as a thinking tool; to support decision-making; to derive new design ideas; as an extension of short-term memory, and finally as a persuasive aid. The dialogue between teacher and student is decisively influenced by the representations the student brings to the discussion. For a studio teacher, VDRs are a useful mean to assess the project's problems and merits; but VDRs are also a record of the student's design process, therefore, an examination of VDRs has the potential to reveal the student's thinking.

In other words, the visual design representations of a student leave a trace of the reasoning involved in their making, like a fossil record of the student's design process that the teacher can uncover. Davies and Elmer [21] reached an insightful conclusion regarding this issue: "if design and technology education seeks to give access to learners' thought processes then the trace of that thinking will be mostly captured in learners' concrete modelling and specifically in the modelling that has themselves as audience" (p.166). The authors emphasise that VDRs made privately without the purpose of being shown, that is, personal representations used to think, are the ones with the richest potential of revealing the student's thinking. Schön [3] also identified sketches as a particularly useful of this type of representation: "the act of drawing can be rapid and spontaneous, but the residual traces are stable. The designer can examine them at leisure." (p.193).

In short, combining what the teacher perceives in the drawings (or other visual media) with what the student explains verbally, the teacher may be able to string together the student's line of thought, and thus reveal the underlining design process. This enables the teacher to provide feedback and guidance accordingly.

Furthermore, during a design conversation, both teacher and student can engage in sketching as the dialogue unfolds. These quick sketches establish a temporary order that allows the participants to discuss the design without having to consider all aspects that form the complexity of a design situation. Thus, during a design conversation, teacher and student can use sketching to construct a shared 'virtual world' [22].

3.2 A verbal and visual dialogue

The representation of a design situation does not occur only with visual media. It is a combination of modelling and talking. In fact, the primary medium of communication that teacher and student employ during a design conversation is talking. Notice that teacher and student must use verbal language to refer to the visual design representations (VDRs), that is, the VDRs may establish a frame, but words are fundamental to interpret it. Sketches are often ambiguous, their meaning embedded in the designer's thinking, the use of verbal explanations are crucial to decipher, explain, and translate their meaning to others.

Therefore, the language used in a design conversation is connected to the visual representations of the design. That is, the words are a translation of a visual medium to a verbal one. Since VDRs are both representations of the design but also traces of the thought processes involved in designing, then words are critical to understanding a design project. In a paper that reported on observations of student's designing, Cross [23] described how a combination of drawing and talk contributes to the unfolding of the design process, and highlighted the role of words in bridging ideas and visual representations of the design.

The combination of words and visual representations give rise to a 'language of design'. A term proposed by Schön [3], *design language* is primarily an expression of the design process, that is, it communicates aspects of the activity of designing. Furthermore, when used in combination with visual representations, words can also serve to frame the design situation. That is, words can have a complementary role to what is being represented in visual media and contribute to a detailed representation of the design. In this sense, the words spoken during a design conversation are simultaneously a description of designing and a part of it.

Crucially, teachers should pay attention to student's words. If we consider the close connection between visual and verbal communication in a design conversation, then the dialogue can reveal aspects of design activity that otherwise remain implicit. A design conversation, therefore, requires the participants to make their (design) thinking explicit.

3.3 Designing together

The hallmarks of a design conversation are the moments in which teacher and student design together. Cossentino [14] observed that “often, in the course of considering various design choices, student and teacher may ‘design together’. Designing together may involve the teacher sketching directly on the student’s drawing (...) a series of potential design solutions.” (p.43). Notice how design conversations momentarily turn teacher and student into design partners. Here we have the heart of the teaching/learning process in design; the moments when the student describes her work and the teacher engages in conversation, suggesting possible design solutions, draws, and makes suggestions on how to proceed with the design. In other words, teacher and student engage in a reflective inquiry into the situation in which both are simultaneously engaging with the project at hand. These close and personal tutorials are potentially rich moments for design learning to occur.

Both teacher and student demonstrate, reflect and discuss the design-in-progress throughout a design conversation and it is through this process of demonstration, reflection, and discussion that the student learns how to design as well as how to think about designing. The iterative dynamic provides the student with a rich experience, in which the student connects their thinking from the project at hand with reflection about approaches to design situations in the future, thus building their design knowledge from project to project.

4 CONCLUSION

The ultimate aim of the design studio is that students learn, that is, acquire or construct their personal design knowledge. The model we presented here describes some of the conditions that have made the design studio a rich environment for learning how to design.

Design conversations place teacher and student in a practical dialogue in which both explore the possibilities and constraints of a design project. These moments of teacher and student designing together are pedagogically interesting; the student witnesses the teacher posing questions, raising possible solutions, and exploring the design situation. As teacher and student work together, the initial conditions and constraints of the project shift; new ideas and solutions call for a reformulation of the problem’s initial boundaries. This exploratory approach is an approximation to the real practice of designing and therefore a productive learning experience for the student.

Design conversations are a form of design activity, and design activity is by nature ill-defined. Therefore the indeterminacy is an integral part of a design conversation. By indeterminacy, we mean that each design situation is unique and there are no perfect solutions for a design problem, only better or worse ones, which renders the design process – to a greater or lesser degree – unpredictable. This instability is naturally present in the early stages of a design project.

It is important to note that experienced teachers are expected to be more comfortable with this built-in indeterminacy than the students. In fact, a voluntary effort to reformulate the project’s presuppositions is consistently observed in the performance of expert designers, who seem to create ill-defined conditions even as the initial project conditions evolve and become more stable and definite. Unstable situations foster an explorative approach that we have seen is conducive of meaningful learning experiences. However, it should be noted that it is difficult for a design student to manage the sudden instability of the design situation; therefore, design teachers should be aware that it is their role to guide students through the uncharted territory of a design situation.

A final note to reinforce the awareness that knowledge about designing is mostly tacit knowledge, that is, designing is a form of know-how that remains implicit in the action(s) of the designer. That is why design education is fundamentally based on a tutorial between teacher and students, in which the teaching/learning process relies mostly on a learning-by-doing format. Yet, if knowledge about designing remains implicit and elusive how teachers are supposed to teach it to students who can only grasp what designing is after they have done it themselves?

Our model suggests that knowledge about designing does not remain tacit to the extent that is usually thought. It seems clear that teacher/student interactions can be described as a practical conversation, that is, a dialogue centred on the student’s project where talk is often complemented with practical demonstrations through (mostly) sketching; yet, design conversations also require that knowledge about designing be rendered explicit (through words) for shared communication and reflection. In fact, reflective practice [3] must necessarily be based on explicit knowledge rather than on tacit knowledge, otherwise there is nothing to reflect upon; this final point means that design conversations are a rich field of inquiry for researchers interested in uncovering the mechanisms of design thinking.

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