A theoretical model for studying design inquiry in a real-world context

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Citation

A Theoretical Model for Studying Design Inquiry in a Real-World Context

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Abstract: Schön's contribution is significant in defining and understanding design inquiry, though he wrote little about its socio-cultural aspects, as Dewey initially intended. While ethnographic research has provided insight into the socio-cultural aspects of designers' inquiry, it poses several methodological challenges for observing designers in action in real-world contexts. In reference to pragmatist theories of design and professional action, this article proposes a theoretical model for qualitatively observing and analyzing designers' inquiry in real-world contexts. The model aims to capture design inquiry in a richer and more holistic way, by including its socio-cultural aspects. The model serves as a collection and analysis tool compatible with the shadowing investigative approach. It emerges from a previous study of video game artists. The discussion addresses the contributions and limitations of the model and points out the value for the enrichment of Schön’s thinking, and for the research and teaching of design practice.

Keywords: Schönian design inquiry; ethnographic perspective; social process of design; video game artist

1. Introduction

Schön's contribution to design is significant for the study of design inquiry and designers' reflection in action (Dorst & Dijkhuis, 1997; Bousbaci, 2008; Cross, 2011; Rylander, 2012). Indeed, Schön proposed a comprehensive view of the design process (Dorst & Dijkhuis, 1997) and sought to make explicit designers' professional knowledge (e.g. Schön, 1983; 1987; 1992b). His concept of “frame” (Schön, 1983; Schön & Rein, 1994) has conceptualized and operationalized designers' creative problem-setting and problem-solving skills (e.g. Dorst & Cross, 2001; Cross, 2004; Paton & Dorst, 2011). The same concept has been used to study the team design process so as to explore the skills of collaboration and shared understanding (e.g. Cross & Cross, 1995; Valkenburg & Dorst, 1998; Kleinsmann et al., 2012; Zahedi & al., 2016).

Schön's (1992a) conception of “design inquiry” refers to pragmatist inquiry according to Dewey (1938). Indeed, Schön takes up the Deweyonian concept of “situation” to say that designers must converse with the materials of a problematic situation and take into account its parameters and its evolution (Schön, 1992b). In the background, he takes up the Deweyonian concept of “transaction”,

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i.e. a process of reciprocal influence between a person and his environment. Schön wanted to make professional knowledge in design explicit, as in other fields, and to show how professionals act on complex situations that arise in their real-life context (e.g. defining/solving a problem well; (re)frame a situation well).

However, Schön's conception is called into question, apart from his late contribution (i.e. Schön & Rein, 1994), for insufficiently addressing the “socio-cultural” aspects of design inquiry. For example, Forester (2012) criticizes Schön for not addressing the social dimension of the political in designers' reflective practice, i.e. all the issues of power, relationships, negotiations, interests, values, etc. that influence their motivations and reasons for acting in real-world contexts. Similarly, Kimbell (2011) argues that designers' intentions are not disembodied from their situated working context and that an overly cognitivist perspective of design thinking (i.e. such as Schön’, Cross’ and others') would be limited in adequately explaining, among other things, why designers adopt a particular cognitive style. Kimbell raises the need to explore situated design activity by studying designers in the world and in relation to other social actors, including artifacts and other social practices and institutions. If we take up Dewey's (1938) method of inquiry, it does indeed proceed through a cultural and social matrix: “Inquiry is a mode of activity that is socially conditioned and that has cultural consequences” (p. 37); “All inquiry proceeds within a cultural matrix which is ultimately determined by the nature of social relations” (p. 762).

Bucciarelli’s (1988; 1994) ethnographic perspective captured the socio-cultural aspects of the designer-engineer’s process through observations and interviews. This perspective has allowed for a more complex and holistic understanding of the designer’s process, not only cognitive and situated, but also socially constructed and influenced by the cultural context in which practitioners work. Bucciarelli observed both individual and collaborative activities of designers, assuming that these activities would potentially involve significant design actions and could influence the way of designing and the final form of the artifacts developed. Building on these ideas, studying designers’ inquiry in real-world contexts would nevertheless pose several methodological challenges, such as the need to capture:

- The embodied character of the practitioner designers studied; understanding their world view;
- The simultaneous complexity and singularity of real situations;
- The reciprocal influences between a designer under study and his/her context of practice;
- Interference between individual activities and collaborative activities of a designer under study within a multidisciplinary team;
- The inquiry process outside of predetermined activities, locations and times.

We add to this list the need for mobility and adaptation of ethnographers in the face of unpredictability and change in the field. It is precisely to overcome such challenges that ethnographic methods of data collection such as “shadowing” are used: “a research technique which involves a researcher closely following a member of an organization over an extended period of time” (McDonald, 2005, p. 456). According to McDonald, shadowing enables the researcher to: generate very detailed, first-hand data; capture the mundane, trivial and difficult to articulate aspects of organizational life; holistically and contextually capture behaviours, opinions, actions based on lived
and observed situations; see through the eyes of the ‘shadowed’ person. Finally, shadowing is an itinerant technique that allows a lot of mobility and flexibility.

This article proposes a theoretical model for qualitatively observing and analyzing designers’ inquiry in a real-world context. The model conceptualizes and operationalizes five dimensions that structure design inquiry. It is intended to be compatible with the ethnographic approach of shadowing. The model aims to better capture the socio-cultural aspects of design inquiry in order to capture it in a richer, more complex and more holistic way. In connection with the theme of the conference, this article aims to enrich the Schönian conception of design inquiry and the ways of studying it in a real context.

The proposed model initially emerged from an earlier study of the professional practice of artists working in video game development (Hawey, 2021). The study in question stemmed from a lack of scientific knowledge about the actual, situated practice of developers in video game studios, beyond just describing technical expertise (O’Donnell, 2014; Whitson, 2018). We wanted to understand the “design-like” practice of experienced artists, with reference to pragmatist/constructivist design theorists (e.g. Schön, 1983; 1987; Cross, 1995; 2011; Bucciarelli, 1994). The main reason was that an important part of the work of these artists is to “design” in multidisciplinary teams during the preproduction phase of projects. Subsequently, the model guided our observations of artists in their respective studios and our analysis of their reflective design process in relation to a social design process and a cultural studio context. The results provided a better understanding of the competent professional practice of artists and thus helped to inform and guide professional training in this area.

In section 2, we present the proposed model and its conceptual framework, namely pragmatist/constructivist theories of design and professional action. Section 3 then shows how to apply the model through case studies. Section 4 discusses the model.

2. The model and its conceptual framework

To help structure and operationalize the proposed model for studying design inquiry in a real-world context, we refer to Babbie (2008) circumstantially and practically for methodological considerations. According to Babbie, the concepts that researchers wish to study remain “constructs” that do not exist in the real world but can be useful for organizing, communicating about, and understanding things that are real. While constructs are not real, “they have a definite relationship to things that are real and observable” (p. 136). Then, by identifying the most important aspects of a concept, what Babbie calls its “dimensions” (p. 137), it can be made more operational or observable. In this way, the specification of dimensions then prepares for a deeper and more sophisticated understanding of the concept one wishes to study. These ideas led us to examine the design and professional practice literature to identify key dimensions that could structure design inquiry in real-world contexts.

2.1 Five dimensions that structure design inquiry

Dimension 1 of design inquiry refers to the habitual modes in which a designer represents, acts and appreciates. These are his/her usual ways of acting (and thinking), even before acting on a situation. Schön (1983) mentions designers’ routine ways of framing situations and problems from their repertoire; ways of appreciating surprising results or effects from their appreciative system. These habitual modes of action are significantly related to “theories of action” (Argyris & Schön, 1974), i.e. the set of principles, values, interests and paradigms guiding effective professional practice. Adopting
the same pragmatist conception as Argyris and Schön, Le Boterf (2008) proposed more recently to understand how a professional usually represents a situation to be dealt with, how and why he/she operates in such a way in his/her routine, and finally, how he/she generally appreciates the effects or the results obtained by his/her actions. These authors understand a professional practitioner as an embodied subject implementing reflective processes in his/her situated context of practice.

In the context of a multidisciplinary design team, a member’s habitual modes of representing, acting and appreciating essentially refer to his/her expertise, or what Bucciarelli (1988; 1994; 2002) calls an “object world”, i.e. “a world of a variety of things particular and specialized modes of representation. Object worlds have their own unique instruments, reference texts, prototypical bits of hardware, tools, suppliers’ catalogs, codes and unwritten rules” (2002, p. 222). Within a design team, this means that the object/artefact and the process will be understood through “different frames of reference” (Bucciarelli, 1988, p.163). In sum, dimension 1 refers to the object world of a designer under study and would be essential to grasp in order to make sense of the embodied character of his/her inquiry.

Dimension 2 corresponds to the design situation, i.e. the particular circumstances and felt states (e.g. doubt, confusion, uncertainty) that motivate a designer to want to act on it. For (Schön, 1983; 1992b), it is the situation that is considered problematic in its complexity (e.g. uncertainty, uniqueness, etc.). It is therefore a question of grasping what a designer considers problematic or “wicked” (Rittel & Webber, 1984) in a situation observed in his/her work, grasping his initial understanding and reconstructing it as the situation evolves. According to Le Boterf, it is to want to grasp what a professional considers relevant to deal with, as well as the satisfactory consequences he/she expects to obtain. After a professional has acted on a situation, it is necessary to understand how he/she considers it less problematic, resolved, satisfactory, clearer or impossible to transform as desired, which refers to his/her “reflection-on-action” (Schön, 1983).

Dimension 3 refers to everything that a designer individually implements conceptually and/or artifactually to act on a situation, after having built an initial understanding of it. This is his/her reflective process composed of various activities (e.g. experimenting, imagining, evaluating). For Schön (1983; 1992b), this takes the form of “reflection-in-action” or “reflective conversation with the materials of a situation”, where surprises and emergences can occur. At this point, the designer can (re)construct his/her sense of the situation, (re)formulate his/her ideas and revise his/her initial hypotheses, based on his/her appreciation of the results obtained along the way. For Schön (and also for Cross (2004; 2011)), design activity aims to produce tangible artifacts (e.g. visual representations in the form of sketches) and/or to propose strategies for action. These artifacts serve as functional partial views (i.e. sketches, prototypes). Both Schön and Cross see design activity as holistic thinking through parallel cognitive processes (e.g. problem/solution; whole/parts). In this way, design activity often involves navigating uncertainty and incomplete information. According to Cross (2004), design activity involves interpreting an initial brief, creating meaning and new solutions, and frequently reasoning abductively. In sum, the cognitive operations of a designer and the artifacts he/she produces must be understood as highly guided by his/her habitual modes of practice (dimension 1) in order to address a problematic situation (dimension 2).

Dimension 4 aims to capture the social process of design, i.e. the co-reflective activities and social interactions in which a designer under study participates, in parallel to what he/she implements individually (dimension 3) to act on a situation (dimension 2). According to Bucciarelli (1988; 1994;
The design process is socially constructed as it promotes the co-construction of meaning, consensus, values and artifacts through discussions between designers and other experts:

“The process of designing is a process of achieving consensus among participants with different ‘interests’ in the design, and that those different interests are not reconcilable in object world terms [...] The process is necessarily social and requires the participants to negotiate their differences and construct meaning through direct, and preferably face-to-face exchange” (Bucciarelli, 1994, p. 159).

Several researchers adopting a similar perspective refer to Schön’s conception (e.g. Valkenburg & Dorst, 1998; Stumpf & McDonnell, 2002; Kleinsmann et al., 2012; Zahedi & al., 2016). These same researchers agree that the complexity of the products developed and the design problems require the work of multidisciplinary teams comprising several fields of expertise. They understand the activity of design as a situated process involving collaborative and co-framing dynamics. Although Schön (1992b) considers the activity of architectural design as significantly social and communicative, he has elaborated little on this issue.

In order to understand the complexity of the design process, Bucciarelli sees it as important to study the interrelation between the designer and his/her context of activity in which both can influence each other: “To understand design process as it is, one must accept [the] context making and unmaking as part of the process [...] the invention and elaboration [...] of the milieu itself within which the participants work” (1994, p. 191).

During the 1980s, Bucciarelli conducted ethnographic field studies with designer-engineers in firms, observing both solitary and “collaborative” activities:

“ [...] sitting in on a design review in the board room, leading a meeting in the project manager’s office, [...] laughing, bantering, bickering, cursing, etc. [...] all of the above, and more, are potentially important design acts; all may influence the way design proceeds and the ultimate form of the artifact” (Bucciarelli, 1988, p. 160).

For Bucciarelli (1988; 1994; 2002), each expertise involved in the co-construction of products and processes embodies a distinctive object world (see dimension 1); experts are involved in the collaborative and deliberative activities of designing and prototyping the product and/or process itself, as well as in planning and organizing activities. In order to overcome conflicts of interest and values in multidisciplinary teams, the expert members have to put aside their own object world and engage in discussions on common and less rigid grounds (e.g. related to product design).

And last but not least, dimension 5 refers to the specific cultural context in which the design inquiry takes place (e.g. studio, agency, company). This dimension aims to grasp the “ecology” (Bucciarelli, 1994) of the design process of the designer studied, i.e. the whole of the cultural, organizational, technical and institutional environment with which he/she interacts. This dimension includes, for example, the corporate culture or philosophy, in the sense of values, interests, implicit/explicit rules and preconceptions. It includes the constraints and challenges that characterize a particular real-world context. In sum, this dimension aims to understand the reasons and motivations that drive a designer to act in his/her real context of practice.

So far, our review of the literature has identified five dimensions to be seen in interrelation (Figure 1) in order to capture the dynamics between a designer under study, events, and his/her actions and actual context of inquiry. In this sense, the inquiry of the designer under study can be captured in a
certain multidimensionality, offering a more holistic view and better revealing the social and cultural considerations that may influence.

Figure 1. The five dimensions structuring design inquiry in a real-world context.

2.2 Operationalizing the five dimensions

According to Babbie, once the dimensions of a concept one wishes to study have been well specified, one must then identify the “indicators” of each of them in the real world of practice: “An indicator is a sign of the presence or absence of the concept we’re studying” (Babbie, p. 136). In other words, the dimensions of the concept must be operationalized.

Following this line of thought, the concept of “frame” (Schön, 1983; Schön & Rein, 1994) emerges from the design literature to operationalize the identified dimensions. Among other things, this concept has been used to make sense of design situations (Dorst & Dijkhuis, 1997); to signal designers’ creative and cognitive skills (Dorst & Cross, 2001; Paton & Dorst, 2011); to signal shared (co)understanding in design teams (e.g. Valkenburg & Dorst, 1998; Kleinsmann & al., 2012; Zahedi & al., 2016); to make sense of rhetoric and argumentation in design teams (Stumpf & McDonnell, 2002). According to Schön (1983; 1992b), the action of “(re)framing” or “seeing” refers in its narrower sense to an initial/new/provisional understanding of a situation, a problem and/or a form; the action of “moving” refers to experiment in technical and conceptual means and elaboration of proposals, sketches and/or strategies.

In its broader sense, a frame can be understood as a structure of beliefs, perception and appreciation (Schön & Rein, 1994). This refers to a practitioner’s mental schema of action, which is very similar to the theories of action seen with Argyris & Schön and to what Le Boterf calls a professional’s “operative schema”, in reference notably to Piaget. Schön & Rein likewise referred to Piaget: « [o]ur use of the idea of framing is radically constructivist, in the sense described, variously, by Jean Piaget [...] » (p. 215). In order to study the competence of a professional practitioner, Le Boterf proposes to
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Understand his/her operating patterns, in addition to the internal resources, reasons and motivations that lead him/her to act.

Building on the ideas presented, the concepts of frame and schema refer to a generative and invariant structure for acting on a class of situations; made up of goal(s) and anticipations; rules of action, information and control; operative invariants; possibilities of inference. In the case of a practitioner under study, this more general structure therefore takes the form of a ‘meta-frame’, which is also similar to the object world seen with Bucciarelli in an expert designer within a team; a structure for thinking and acting from which his/her ways of posing and solving problems in particular will derive. Another fairly invariant basis refers to the “constants” in professional practice (Schön, 1983), i.e. the set of media, languages, repertoire, appreciative system, overarching theories and role framing that serve as solid and stable references and support for practitioners to reflect-in-action.

The concepts of frame, schema, object world and constants will help to operationalize the identified dimensions of a designer’s inquiry in a real context. Table I below shows how each dimension is operationalized using the indicators mentioned. In the right-hand column, the indicators are anchored in 1) what the designer under study says, 2) the actions he/she takes, 3) what he/she understands, 4) the co-construction of meaning between the designer and the researcher, as well as 5) the work environment where he/she is observed. The table also reveals that the indicators are “interchangeable” (Babbie, 2008), i.e., they can potentially, and preferably, indicate several dimensions at once.

Table 1. The five dimensions of design inquiry and their indicators.

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Practitioner’s habitual modes of representation, action and appreciation</td>
<td>Reference paradigm, tools, procedures and theories related to expertise and experience, initial training; various representations for products, processes, users/collagues experience; general ways of thinking and doing, general structure of interests, values, beliefs, preconceived ideas (Argyris &amp; Schön, 1974; Schön, 1983; Bucciarelli, 1994; Schön &amp; Rein, 1995); constants such as media, repertoire, languages, appreciative system, overarching theories, role frame (Schön, 1983).</td>
</tr>
<tr>
<td>(2) Problematic design situation</td>
<td>The designer’s (re)framing and understanding of the problematic elements, circumstances, facts and states that motivate his/her design inquiry (Schön, 1983).</td>
</tr>
<tr>
<td>(3) Individual reflective design process</td>
<td>The designer’s elaboration of plan, actions or strategies, the set of his/her move experiments, proposals, prototypes and evaluations; his/her use of specific technical and conceptual means; his/her reflection on action and situation (Schön, 1983; 1992b; Cross 2004; 2011).</td>
</tr>
<tr>
<td>(4) Social design process</td>
<td>Social activities or interactions involving the designer (e.g. formal and informal meetings, ad hoc)</td>
</tr>
</tbody>
</table>
conversations); social activities in which interests and values are (re)discussed, consensus is reached or not; in which understandings, goals, perspectives are shared or (re)constructed; in which the designer co-constructs with colleagues, takes actions to interest and persuade them (Bucciarelli, 1988; 1994; Schön & Rein, 1994; Valkenburg & Dorst, 1998; Kleinsmann & al., 2012).

(5) Specific context of practice
Generic and specific studio/firm characteristics, culture, philosophy, organization, and challenges (Bucciarelli, 1994).

3. Application of the model to the shadowing of practitioners
After presenting the dimensions and indicators of the model, we show how to use the model to collect and analyze data through practical case studies. We refer on a previous study, as already mentioned, which had the objective of studying the design-like inquiry of experienced artists during the preproduction phase of a video game project. We used the qualitative interpretative methodological approach of “ethnography” (Hammersley & Atkinson, 2007) in order to observe artists in their actual context of practice. Between 2016 and 2018, we had studied three cases of practice (each case = one artist observed in a Montreal studio over a period of 8 to 13 days), using the “shadowing method” (McDonald, 2005) mentioned earlier. The development of the five dimensions took place mostly during the analysis of the first case. Iterative work on the initial results, the literature review and the theoretical proposals allowed us to refine our research question and to better solidify the model for studying subsequent cases. In this paper, we present the latest version of the model.

3.1 The model used as a data collection tool
From the outset, the five dimensions identified helped to pre-structure our observations and interviews with each artist studied. For example, an initial interview with the artist made it possible to identify dimension 1, which we wanted to corroborate by observing his/her actions during the stay. The same interview was used to identify other dimensions, such as the situation to be addressed (dimension 2), although this could evolve and therefore be revised and reconstructed along the way through subsequent clarification or debriefing interviews with the artist.

According to Le Boterf (2008), one must grasp the “diagnosis” of the situation if one is to understand the thinking patterns of a professional under study. For Schön, one must grasp the professional’s initial frame of the situation, as well as any subsequent potential reframing. However, in our data collection, this became more feasible when we debriefed with the artist under study. In the debriefings, we were able to capture what the artist puts into words, update what he/she understands, and corroborate with our observations of his/her actions during solitary and collaborative activities. The debriefings allowed us to clarify observations, confirm and revise our initial understanding of the inquiry studied. Subsequent debriefings served to verify whether the artist thought a posteriori he/she had handled the situation well.
In each case studied, dimension 4 (i.e. the social design process) and its indicators helped to describe and analyze the formal and informal collaborative activities in which the artist participated and which influenced his/her design inquiry (see subsection 3.4 for the example given). This was used to understand implicit rules, power dynamics, cognitive conflicts within the studio, the project, the teams. It allowed us to capture socio-cultural elements that challenged and motivated the artist to want to change a situation that was deemed problematic.

3.2 The model as an analytical tool

With reference to Bucciarelli (1984), we analyzed each case by adopting two modes: “narrative” and “topical”. In narrative mode, we organized the data into a coherent, chronological, and synthesized narrative, based on what had preoccupied the artist under study. We described each case in the same way, listing the events, activities, actions, strategies and words observed. Then, like Bucciarelli, we inductively analyzed the selected data using categories (topical), referring to our pragmatist and constructivist theoretical perspective.

Using the five dimensions presented above, each of which would be transposed as categories of a case (Figure 2), we described and interpreted what was understood. This analysis allowed us to identify similar patterns and contents in the three artists studied in terms of state of mind, situation, thought process and socio-cultural context.

3.3 Several forms of results

The theoretical model allowed us to obtain several forms of results. The first form was a “thick description” (Geertz, 1973) of each case, that is, the detailed description, categorization and interpretation of the inquiry of a singular artist in his/her singular context of practice. In our multiple case study, this served as a tentative understanding for each case separately. Another form was the “cross-synthesis” of the three cases studied, i.e. “[...] a compiling of data for a multiple-case study, by examining the results for each individual case and then observing the pattern of results across the cases” (Yin, 2014, p. 238). This synthesis provided our tentative understanding of a cross-cutting (and therefore more transferable) model of the design inquiry of the artists studied. To structure the synthesis, we again used the five dimensions and applied it to the three participants studied. This prepared and structured the validation interview with each of them, using a pragmatic approach.

3.4 An example illustrating the socio-cultural aspects of the design-like inquiry

Drawing from our first case studied, we give an example illustrating the socio-cultural aspects of the design-like inquiry of an artist under study. In a team of 21 developers, this artist created the 3D
environments and acted as the main art director. He collaborated with a level designer to prototype the game designer’s intentions into playable versions. The adventure/survival game developed was set in a 3D universe and represented a hostile and believable prehistoric jungle. First, Table 2 highlights the observations that helped make sense of the emerging categories along the five dimensions presented above.

**Table 2  Examples of observations that helped categories emerge**

<table>
<thead>
<tr>
<th>Observations</th>
<th>Emerging categories</th>
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<tbody>
<tr>
<td>The artist expressed to his colleagues two principles that he wanted applied by the whole team: that 1) the design of the game experience should be more holistic and harmonize gameplay and visual credibility; that 2) ideas should be prototyped and playtested in the game engine. Several times during the stay, the artist acted in accordance with these principles.</td>
<td>The artist’s habitual modes of representing, acting and appreciating, or object world (dimension 1).</td>
</tr>
<tr>
<td>Through early discussions with us, the artist expressed that the creative director found the game experience boring at the moment because it lacked danger and stress. He also expressed that while many collaborators felt the game designer was not generating enough ideas and didn’t know how to prototype them, the only solution he proposed and overused was to add a tiger here and there in the jungle. This felt state was observable through the creative director’s review in ‘stand-up’ meetings. By understanding these circumstances and felt states, the artist was unsatisfied and wanted to transform the situation.</td>
<td>The artist’s framing of the problematic situation (dimension 2).</td>
</tr>
</tbody>
</table>
| The artist designed, prototyped and appreciated a custom solution to improve the game experience: a particle system simulating a swarm of bees that could be placed near the fruit to encourage players to approach it to feed, with the danger of being stung, but without being killed. According to the artist, this contributed to the overall aesthetic experience of the game:  

> “It’s adding danger in the trees, so it’s meeting a current design need. But to me, it’s also adding something to the living and breathing world, to the credible environment of the game... If you add that, it adds life, it adds credibility, it adds immersion, and it adds to the fun factor. Because danger is part of the game; it’s part of the fun factor”.

| The artist’s individual reflective design process (dimension 3). |
|----------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| To make his colleagues understand and generate interest, the artist prepared a video to send them, i.e. a capture of him in player mode getting harmed by approaching the particle system placed near a fruit in a tree. The artist ensured his proposal was interesting and legitimate in the eyes of the creative director | The social design process (dimension 4). |
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Based on our discussions with the artist and some of his colleagues, the philosophy of the studio encouraged initiative and role taking to propose ideas. During the stand-up meetings, we observed the team and the decision makers negotiating, evaluating and validating the game and its contents. The creative director appeared as the main decision maker to validate the quality of the product. According to the artist, he and the creative director were long-time colleagues and friends; they had mutual respect and trust. Also, the game designer was only working 2 days/week, due to another job, which was raised in the stand-up meetings as a long-term issue.

Second, based on these observations at least, we understood that while designing a technical solution, the artist had also to develop a particular strategy to interest his colleagues. In this sense, categories (dimensions) 4 and 5 helped to understand his strategy as central in his design inquiry and as tailor-made to the socio-cultural aspects of the situation.

4. Discussion

As mentioned earlier, this article aimed to enrich the Schönian conception of design inquiry and the ways of studying it in a real-world context. To do so, we have proposed a model that conceptualizes and operationalizes five dimensions to better structure the design inquiry according to the Schönian conception. We wanted the model to capture the socio-cultural aspects of design inquiry, so as to capture it in a richer, more complex and holistic way. Our study referred to the main contributions offered by Schön in design and professional practice, as well as to other authors adopting a similar perspective. To see the field application of the proposed model, we showed its compatibility with qualitative approaches related to the case study of practice, such as shadowing for data collection and interpretative analysis. We would like to add the present reflection to the discussion on the challenges and requirements of studying design inquiry.

The theoretical model is proposed as a toolkit for ethnographer and shadower researchers interested in studying design/design-like inquiry in real-world contexts. It could help, for example, to refine a research question, targeting key dimensions to be explored or further expanded. It could subsequently help guide both the data collection and analysis processes, serve to study one or more cases, or make sense of a particular and/or transferable model of design inquiry.

The model allows for embodied, situated and ecological aspects of design inquiry to be addressed. It is in this sense that it would allow for a complex and holistic study. The model helps to shed light on the interactions that take place between a designer and his/her socio-cultural environment of practice, with reference to the Deweynian conception, but which has been less conceptualized by Schön. Therefore, the model could help grasp the dynamics between expertises (disciplines) in
complex multidisciplinary team design processes, or to understand the politics, reasons and motivations that drive the designers studied to act within projects and/or teams.

Furthermore, the model could help to make design knowledge and design skills more explicit, which could be particularly useful for studying “wicked/ill-defined” (Rittel & Webber, 1984) design and design-like practices. In addition, the model was developed to go beyond capturing technical expertise alone, but rather to capture social, human and humanistic skills, often required in professional practice in general. In the field of video games, technical expertise remains the most studied, understood and promoted object. If design skills are part of the future skills for the 21st century, our study points towards the need to improve the teaching of emerging practices in the creative and cultural industries. A better description of design inquiry in these real-world contexts would provide insights into the necessary professional meta-skills, such as collaboration, creativity, interdisciplinarity, communication, and empathy for the human actors involved in complex projects.

An important limitation of the proposed model would be to address only the five dimensions presented, despite the intention to study the design inquiry in a complex way. Therefore, we believe that it may be relevant to combine other dimensions. For example, the “historical” dimension of the designer would serve to deepen the “before” of his/her reflective processes observed in the “here and now”; to better understand continuity and/or change in his/her pre-existing socio-historical logics. Also, the “technological” dimension could help to better understand the artifacts produced, the technologies designed and used, and their potential influence on the designers studied. However, adding an additional dimension could further complicate the use of the model. Our future research will aim to further explore the proposed model and potentially enhance it with additional dimensions.

5. References


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**Dave Hawey** is a professor of digital art and design at the School of Digital Arts, Animation and Design (NAD-UQAC) and director of the Praxis lab. His background is in videogame development. His research is focused on the practice and education of videogame artists.