Fostering Creative Design Dialogue

A Research Based Online Catalogue of Video Clips

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Design dialogue with clients, including potential users of the design, is a crucial element of designing, and a worthwhile skill to teach in design education. Moreover, in educational settings, client contact can help to make design activities more relevant and authentic. But how can the genre of design dialogue be taught? In this explorative study, we collected and analyzed examples of design dialogue in an online video catalogue, to be used in design education. A literature study about creative design dialogue formed the foundation for the video catalogue. This informed the research team about important qualities in design dialogues. Subsequently, video recordings were made of design dialogues in educational settings. The recordings were made at two levels of education (post-secondary vocational training and university level) across a variety of design domains: building engineering, industrial design and multimedia design. Analysis of the videos was based on the literature study and on interviews with design teachers. Thirty-six short fragments across varying educational settings were selected as being most relevant for design teachers and students. Each of these shows one quality of design dialogue that is also described below the video. A quality is, for instance, that it combines stages of persuasive presentation about a prototype (or other model) with stages of open discussion. In a follow-up empirical study, the research team aims to describe how design teachers can use the online video catalogue as a tool for learning.

Keywords: Design dialogue, video catalogue, genre pedagogy, technology education, language

Introduction and problem: lacking models to teach about design dialogue

Authentic design projects, whereby learners are involved in real life projects, are often seen as an essential part of design education and applied in a range of educational settings. In these projects, learners discover that design is driven by human needs and wants (Kimbell & Stables, 2008). This often requires communication about these needs and possible solutions, between the designer and persons whose needs are to be met (users).

Often, there are also companies and other organizations involved in these real life projects as they want to develop new products, we will refer to these as 'clients'. Communication with these clients about the problem to be solved, needs and possible solutions usually occurs at the start of the design process, during the process and at the end. These instances have different functions, as summarized in table 1.

Table 1. Instances of communication with client(s) in an educational design process

Moment of design dialogues	**Functions**
Start of the design process	Making sense of the problem Inventory/Identifying of needs and possible solutions. Reaching consensus about 'must haves' and 'nice to haves' Reaching consensus about the process of designing and communicating
Intermediate stage of the design process	Reaching consensus about qualities and possible improvements of initial solutions Reaching consensus about the remaining process of designing and communicating
End of the design process	Providing information about the functions, use and maintenance of the product Discussing strategies for implementation of the design Evaluating the product and the process

This project focusses on dialogue during the design process. Communication in this phase is particularly interesting in educational settings, because by then a student (or team) has already elaborated on possible solutions. The student designer needs to persuade the client of qualities of these ideas, but also to find out how they can be improved upon. Therefore the design dialogue at the intermediate phase is a potentially rich learning activity to bolster 'designerly thinking' (Kimbell & Stables, 2008).

In The Netherlands, and probably elsewhere too, design dialogues are becoming more important in education, because students are increasingly expected to design for an authentic client with a real need, for reasons of making learning activities more meaningful, motivating, and effective (Kimbell & Stables, 2008). Alternatively, a teacher acts as a simulated client during design dialogue. However, little is known about pedagogical interventions around design dialogues to achieve learning outcomes in designerly thinking and communication skills (Silva Ordaz, Klapwijk & Van Dijk, 2018). Such interventions would at least need to provide clarity for students about qualities of design dialogue.

Qualities of design dialogues have been described in literature about professional design practices that could be translated into to instructional texts for students. However, due to the multimodal nature of design dialogues, which typically rely on 2D and 3D models and gestures in combination with text, video is a more suitable medium to clarify these qualities to teachers and students. Such videos do not yet exist to the best of our knowledge, nor is it clear how they could be used in design education settings. The project described in this paper is meant as an exploration into closing this gap and focusses on making an annotated online catalogue of video clips with examples in which students from secondary vocational training and university students discuss their intermediate design ideas with clients (in Dutch available at: ontwerptaal.nl).

Theoretical framework

Genre pedagogy

A central assumption in this project is that students' learning can be supported by explication of important qualities in design dialogues. This is also a basic principle of genre pedagogy, an approach that has informed this project. Genre can be described as regularities in oral and written texts or graphic representations. Genres are goal-oriented and they serve communicative and social purposes. A regularity in a genre can for instance be a commonly used text structure, the use of domain specific vocabulary and a certain tone of voice. Genres are not static, but they evolve within context and they can often be used creatively (Rose & Martin, 2012). Genre pedagogy is an approach whereby subject teachers make the characteristics of the genre to be produced by their students explicit, by means of modelling the genre and gradually increasing students' independence. Functionality of language use in specific contexts and situations is foregrounded. Even when students are already experts in communication, they need to master the specific genre of design dialogues with clients.

Design dialogues

What is currently known about this genre? Terminology for design dialogues varies across design communities and practices. Terms that are for instance used, are: design presentation, studio, design critique, crit, jury. In order to emphasize the dialogic nature of the genre, we use the term design dialogue. In educational settings, the dialogue is not only between the student-designers and the client, typically peers and a teacher or facilitator from their educational institution will be present. As a result, the design dialogue genre often combines characteristics of professional and academic genres.

The genre is experienced as 'emotional' (Frederickson, 1990) by students, as a result of receiving feedback as novices, on work that they strongly identify with. Furthermore, the design dialogue is a multimodal genre that relies on the use of visual artefacts that serve as models to exemplify certain

aspects of the design. These can be sketches, CAD drawings, foam models, working prototypes, mood boards or user stories. Gestures are commonly used in combination with words, to explain form and function of these models in relation to the design problem and the program of requirements for the design (Dannels, 2005; Jornet & Roth, 2018; Murphy, Ivarsson & Lymer, 2012).

The overall goal of a design dialogue at the intermediate stage of a design process is twofold: On the one hand, a designer tries to persuade the client that his initial ideas are valuable. This asks for a confident tone and strong arguments in favor of the design ideas. On the other hand, the designer wants to engage the client to think as a co-designer, which asks for openness in the conversation. There is a certain tension between these two goals (Newman & Landay, 2000) that needs to be taken into account, for instance when decisions are made about the level of details in the 2D and 3D models to be presented. The more details a model shows, the better the design can be evaluated, but this lack of ambiguity comes at the cost of space for (co)design thinking during the design dialogue (Eckert & Stacey, 2000). Furthermore, clients do not always understand why a certain model is used, for instance, why a sketch deliberately looks fuzzy, and this may lead to confusion. It is therefore advisable to make the function and the status of a model explicit to the audience.

Dannels (2005) and Swales, Barks, Ostermann and Simpson (2001) distinguish between two broad stages in this genre, a presentation and a discussion. The presentation is persuasive and characterized by BLUF (Bottom Line Up Front) (Dannels, 2002), which implies that the overall concept is presented first which is followed by details and information about the process that led to these ideas. Persuasive strategies at this stage typically include (Eckert & Stacey, 2000; Dannels, 2002):

- Referencing to existing designs and emphasizing uniqueness of the design
- Emphasizing advantages for users
- Using technical norms, calculations in argumentation, particularly in engineering design
- Emphasizing mood, values, styles, particularly in 'softer' design practices (e.g. multimedia design)
- Referring to needs of users of the product, even though they may not yet fully understand what their needs could be
- Emphasizing how a product could be used, taking the full context into account

During the discussion stage these strategies are still useful, but now space for feedback and interaction needs to be created by the designer, more specifically (Dannels & Martin, 2008):

- Promoting the open exchange of evaluations and recommendations
- Promoting idea generation
- Promoting feedback on the design process

When designers want the client to further develop and launch the design idea, they need to establish support for their design ideas. However, the discussion is not necessarily meant to get approval for the concept that's on the table, but to move forward in the design process. It can trigger students to reflect on, evaluate and revise their designs (Oh, Ishizaki, Gross & Yi-Luen Do, 2013). In some cases, they may even abandon their design idea and develop other designs that better suit the problem at hand or their client.

This summary from literature does not differentiate across design practices, but differences can be substantial. A user story, for instance, is commonly used in design dialogue about web design, but not frequently in engineering design.

Although students generally understand the learning potential of design dialogues, they have reported negative experiences (Sara & Parnell, 2011; Smith, 2011) and high levels of anxiety. Problems they

encounter are a lack of understanding of success criteria, insecurity, lack of authenticity in terms of the design practice, and low quality of recorded feedback, as written by peers (Smith, 2011).

Modelling the genre of design dialogues and making criteria for success explicit is likely to alleviate some of these problems. In this approach examples of a certain genre are presented by a teacher and, together with the students, deconstructed (Rose & Martin, 2012; Rothery 1995). The deconstruction leads to insight in "what works" in the context of design dialogues and is used as a stepping stone for joint and independent construction of the two moves in a design dialogue – the presentation and the discussion. However, this modelling approach is currently rare in design education and good examples of design dialogues are scarce. This calls for the construction and categorization of examples of design dialogue and explication of qualities within them.

Method

An interdisciplinary research team of five people with extensive experience in design education and language education carried out the exploration and the construction of the catalogue. To investigate what is already known about design presentations and dialogues, a literature search was carried out, using the terms 'design, discussion, presentation, proposal, language, crit, jury, designing, genre analysis, gestures, sketching and multi-modal communication', as well as a snowball method starting from a few key publications. Also, two informants with a PhD in design and five design teachers (2 building engineering, 1 multimedia design, 1 industrial design, 1 mechanical engineering) were interviewed about qualities of design dialogues and problems that students at different levels of education encounter with this genre. Subsequently an empirical investigation was carried out to contextualize what was found in the literature search and to possibly add important qualities of design dialogues that had not yet been found through the literature search. This part of the exploration was carried out as follows. At two educational institutions a total of 14 design dialogues (including presentation) were observed, of which 12 were recorded on video. Different design practices were chosen for the videos: multimedia design (where creativity is paramount), building design (where application of technical knowledge is paramount), and industrial design (combined emphasis on creativity and technical knowledge). All videos were analyzed and coded for specific qualities in the interaction, such as the use of visualization, using objects, images and gestures. Participants were informed about the purpose of the research, the video catalogue, its form, and only those who gave informed consent became part of the catalogue.

The videos did not only serve to find qualities of design dialogues, but they were also used to select clips for the online catalogue. These clips needed to resonate with design students' educational contexts and with their concerns as much as possible. For this reason, design dialogues within educational practices were chosen rather than fully professional practices. These educational design practices also varied across levels of education, both at post-secondary vocational intermediate level and at university level. This would make the clips recognizable for students across educational levels.

The catalogue

The online catalogue with 36 video clips is structured in two ways: It contains clips about (more or less) sequential stages and clips demonstrating overarching qualities that are useful to take into account at each stage.

The sequential stages combine insights from the literature (BLUF model, two stages of presentation and discussion). Based on our empirical findings, it became clear that in intermediate presentations and interviews within design education, it is helpful to connect the intermediate dialogue to earlier dialogues and to provide a summary of the design problem at the start of the presentation.

In literature as well as in the empirical study, many overarching qualities were found. For our design dialogue catalogue, we selected four qualities that are very specific for design dialogues. For the more

general qualities, design educators and students can consult other sources. Firstly, designers should promote a very specific kind of interaction as argued by Dannels and Martin (2008) and this is – due to the emotions involved – not easy for novice designers. Second, visualization is a very important mode in design dialogues and models play a pivotal role. Third, learning to use a functional tone is related to the specific type of interaction with the client that the students should learn to master. Finally, design processes are characterized by arguments about the choices made in the design, and although students, teachers and their clients have a shared understanding of this importance, examples that can be deconstructed are scarce.

This led to a catalogue with ten themes, each presented on a specific webpage. Each theme page demonstrates and describes a number of quality aspects and each quality aspect starts with a question followed by one or more examples. The qualities are formulated as questions, from the assumption that this will make it easier for teachers to use the catalogue as learning material for students. It potentially makes students as readers more active, than a mere description. Furthermore the catalogue contains a page with tips for teachers and a page with theoretical background.

The structure is shown in tables 2, 3, 4. The letter 'L' denotes that the item was derived from the literature study on design dialogues and the 'E' that it was not prominently elaborated in the literature, but its importance became primarily apparent from the empirical investigation.

Table 2. Pages based on the sequence (steps) within a session

Theme	**Questions on the theme page.** **Each question denotes a quality aspects that is also demonstrated (video) and described below the video.**
Presentation E Determining process of the session and objectives for the session	How does this session build on the previous one? E Does the client like to ask questions during the presentation? E
Presentation E Summarizing the design problem	What is the context of the design problem? L (inspired by Swales et al. 2001)) What are needs and wants of users? L (Swales et al. 2001) What are the most important elements of the program of requirements? L
Presentation L Describing solutions (the design) (Dannels 2005; Swales, Barks and Ostermann 2001)	What is the overarching concept of the design/ How does it look like? (Swales et al., 2001) How does the design fit needs and wants of the client? L (Bowen 2007) What are technical 'working principles' as part of systems and sub systems? L (Swales et al. 2001)
Dialogue L Starting off the dialogue	How do you invite the client to co-design? L How do you clarify expectations about participants' roles, also with regard to the role that the teacher may play? E
Dialogue L Exchanging ideas (Dannels 2005, p 155)	How do you discuss pros and cons of solutions and alternative ideas? L(Murphy, Ivarsson en Lymer 2012, p. 537)
Dialogue E Drawing conclusions and deciding about the rest of the process	What can be concluded about strengths and weaknesses of the design and parts of it? L (Dannels en Norris Martin 2008, pp. 143–147) What advice and decisions about the remainder of the design process can be given? L (Dannels en Norris Martin 2008, pp. 143–147)

Table 3. Pages about overarching qualities

Theme	**Questions on the page. Each question denotes a quality aspects that is also demonstrated (video) and described below the video.**
Promoting interaction during dialogue L(Dannels & Norris Martin, 2008)	How do you encourage questioning and giving feedback by the client? L How do you encourage the client to give additional information? L How do you deal with feedback? L
Visualizing, using objects, images and gestures L (Allan 2013; Chang & Szalapaj, 2002; Eckert & Boujut 2003)	How do you combine images, gestures and text to bring your ideas to life? L (McDonnell en Lloyd 2014) How do you explain what is the function of an image/model that you show? E How do you tell the story of potential users of the design in text, physical models and images? L (Morton & O'Brien 2005)
Using a functional tone (Allan 2013; Dannels 2002)L	How do you use a persuasive tone, to increase the client's confidence? L How do you use an inviting tone (using insecurities), to encourage the client to co-design? L
Reasoning about solutions and making choices in interaction L (Murphy, Ivarsson en Lymer 2012, p. 532)	Why does the overarching idea of the design (the concept) fit the design problem? (e.g. focus on form in relation to function) L Why does the design fit the client/users, market and possibilities for production? L (Dannels 2002; Durrant et al. 2018; Bowen, 2007) How do you use technical terms? L How do you use existing research or your own research into user needs and solutions? E How do you use norms, rules of thumb, numbers and scientific theory? L(Dannels 2002) How do you make use of your own preferences as designer? L (Dannels and Norris Martin 2008; Morton and O'Brien 2005; Eckert and Stacey 2000) Why do (parts of) systems function properly; why do systems work together properly; why would alternative systems be less suitable? L What are pros and cons of different solutions? L

Table 4. Other pages

Tips for teachers	Five suggestions for teachers to use the catalogue in their lessons.
Theoretical underpinning	A 5000 words summary for teachers of what was found in literature.

For each question on a page, one or two videos of approximately 2 minutes are shown. Above the video the educational context is described. The description below the video explicates qualities that can be seen in the video, and sometimes a tip that transcends what is shown in the clip. Examples are shown in box 1 and 2.

School: Media Design (vocational, intermediate level)

How does this session build on the previous one?

Second year students present the website they designed for a client. The website is meant to bring supply and demand for internships together. The students are at one fourth of the entire design process.

The student designer summarizes what has been discussed at the previous session and sets the agenda. She also tells that on the day before the presentation, information has been emailed, so everyone could know what the session will be about.

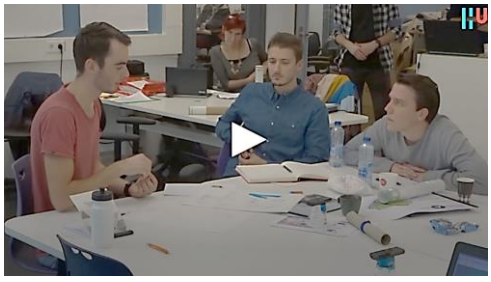
Tip: If information has been sent beforehand, ask whether the client has had time to look into it.

Box 1. Example belonging to the item ’How does this session build on the previous one’?

School: University of Technology

What are pros and cons of different solutions?

In this clip a third year student of industrial design presents an elaborated design for a children’s bicycle to a real client (a company). He elaborates on pros and cons of two different solutions for a sub-system. This session occurs at two-thirds of the entire design process.



The student designer starts off with advantages of the option that he thinks is best. He explains working principles and possible perceptions of the anticipated user. He then talks about a problem with this first option and he introduces an alternative. This alternative does not have the problem that was described for the other one. To persuade the client to choose the first option, he tells what solution he has found for the problem that was mentioned.

Box 2. Example belonging to the item ’What are pros and cons of different solutions?’

Discussion and follow-up

The online catalogue was constructed through a small scale explorative study, therefore the catalogue should not be considered as complete. Some qualities described in the literature, were not present in our videotaped dialogues, e.g. the interaction with the client was relatively limited in our cases. In addition, the participating students are still in the progress of learning to have an effective design dialogue and many of the examples do not show the most perfect dialogue. Nevertheless, we selected students instead of professional designers for our catalogue as our potential users have similar means to present and discuss their designs. Also, it is known from comparative field studies about demonstrations in the tradition of Albert Bandura behavior modelling training, that learners learn more when they see both good and bad examples and not only good examples (Taylor, Wirth, Olvina, Alvero 2016; Baldwin 1992). In addition, nearly perfect examples may set the bar too high and stimulate fear amongst students.

Further development of the catalogue is needed as some important themes such as the use of metaphors (Dogan, Taneri, & Erbil 2018; Swales et al. 2001) or the use of mental verbs to represent the proces of the designer (e.d. think, intend choose) are not yet covered. Furthermore, some of the qualities present in professional design presentations and dialogues described in the literature were not present in our sample. Also, the catalogue does not differentiate between the different disciplines, while the literature indicates that presentations in the field of the more ‘hard engineering disciplines’ need to be about facts and numbers and not about values and personal opinions (Darling 2005), other disciplines such as architecture and fashion emphasize the importance of personal values, perspectives and want students to reason from the ”I”point of view (Morton and O’Brien 2005; Eckart and Stacey 2010)

Discussions about the applicability of the catalogue, with two groups of design teachers, have boosted confidence that the catalogue can indeed serve as a useful source for learning. However, additional research is needed to validate and improve on the catalogue. Two questions need to be answered as part of this validation.

1) Are the chosen quality aspects indeed of great importance to designers?
2) Which quality aspects are most difficult to master for students and need to be foregrounded?

The first question could be answered by further literature study and through a Delphi study among designers from varying disciplines and through analysis of design dialogues in various educational and professional contexts. The second question could be answered by interviewing more design teachers as well as their students.

It is not yet clear how the catalogue could become part of design teachers’ pedagogy. A few suggestions are given as part of the catalogue, but these are not yet underpinned by research. Guiding question for such research could be:

3) In what ways can a catalogue of video clips help students to engage in effective design dialogues?
4) What are teacher roles that support such learning?
5) To what extent and how can the catalogue be used in lower and upper secondary education?

Questions 3,4,5 could be answered by means of ’educational design research’ (Bakker, 2018), whereby teachers and researchers co-design interventions, try them, improve on them and analyze the process of design and implementation to arrive at more or less generalizable conclusions. Preferably such research should be carried out in different educational contexts, as has been the case in the current project, because ’what works’ in architecture education does not necessarily work in education for media design, mechanical engineering, etcetera.

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