Five roles of the designer

Miguel Perez
Linnaeus University

This discussion paper raises some of the ethical issues related to different ways of interacting with teachers in educational design research. A categorisation of five possible roles that the designer may assume is proposed. These different roles will be framed from a perspective that may be referred to a systems approach to design. Focus is therefore put on methodological issues with the purpose to stimulate reflection on matters of design ethics that go beyond anonymity and informed consent.

Introduction

Educational design research may be described as "a family of methodological approaches in which instructional design and research are interdependent" (Cobb and Gravemeijer 2008). This family of approaches explicitly shares a twofold goal. The goal is about addressing real-life problems in classrooms and in teachers' everyday practices, as well as about contributing to theory and our understanding of the processes involved (Barab, 2014; Cobb et al., 2003; Collins et al., 2004; Lesh & Sriraman, 2005; McKenney & Reeves, 2012; Plomp, 2013). Although the field has provided valuable insight into the complexity of education, we are all aware of the continuous difficulties concerning the dissemination of research results. For this reason, some researchers have expressed the need for more encompassing design approaches in which the roles of teachers and other actors are more clearly considered (Cobb, Jackson, Smith & Henrick, 2017; Hoyles & Noss, 2015). As Van den Akker and Nieveen (2017) explain:

> A crucial challenge for more successful innovation in education is to build bridges and more interaction between many levels, factors and actors. One of the most promising strategies is to strive after more frequent and direct interaction between teachers, developers and teachers in educational design, development and research activities. (Van den Akker & Nieveen, 2017, p.76)

Although the idea of increased collaboration with teachers seems good there are also difficulties associated with connecting two different communities – research and practice. But as noticed by Lester & Wiliam (2002), researchers in their reports rarely discuss the difficulties and the ethical issues involved when interacting with teachers and other stakeholders. The aim of this discussion paper is therefore to raise some aspects of design methodology and design ethics that are seldom discussed within the field of design research. Design ethics relates to the

way the decision-making process is organised and how different tasks are divided between different actors. A second aspect concerns the role of stakeholders in the design process and the way in which they are included or even excluded (Devon & van de Poel, 2004). In particular, I will suggest a categorisation of five possible roles that the designer may assume. The roles are called *designer as artist*, *designer as expert*, *designer as facilitator*, *designer as provider*, and finally *designer in service*. These different roles will be framed from a perspective that may be referred to a systems approach to design. To summarise, this paper addresses some particular methodological issues in design. The purpose is to stimulate reflection on matters of design ethics that go beyond anonymity and informed consent.

A systems perspective on design

This section provides the philosophical foundation for the elaboration of the five roles of the designer. Furthermore, in this paper, to design means to be involved in goal-seeking, or teleological, behaviour that aims at creating change, such as improving something or making something more usable or more sustainable, but without the idea of the existence of a final end (Bereiter, 2002; Churchman, 1971; Simon, 1996). Creating change is a process that assumes that something exists first as a given even if the situation or the task may be unclear from the beginning. The designer is often the one who initiates and brings change into the situation by introducing artefacts, such as teaching artefacts or design principles, developed to attain goals.

The researcher as designer

In mathematics education the researcher and the designer are often the very same person (or a group of persons). Still, it may sometimes be convenient to speak of them as though they are two separate persons in order to recognise the kind of considerations that need to be made as many of the design aspects that are involved in design research may relate in different ways to the researcher and to the designer. For example, while the researcher is expected to meet scientific demands from research communities, the designer is expected to meet pragmatic demands in practice. The researcher is expected to be rigorous and the designer is expected to be creative. In particular, the designer is involved in creative processes that strongly depend on subjective judgements. These judgements are established in proven knowledge about the domain of investigation, in this case, mathematics education. In other words, while the designer needs to be immersed in the social context, the researcher has a different role. He or she is expected to provide a rational explanation for the judgements made. Thus, in order to put things into perspective, the researcher may need to momentarily detach himself or herself from the very source of creativity that the designer draws from.

Another dilemma relates to the nature of the designed solutions. While the researcher may require the solution to be innovative with a high degree of

complexity, practitioners may prefer a simple solution that works and is easy to implement. However, such conflicts may in fact be productive: 'Creative design arises when there is a conflict to be solved between the designer's highlevel problem, and the client's standards for an acceptable or useful solution' (Cross, 2006, p.72). Nevertheless, not knowing or having a good idea of how to balance multiple demands may result in neither being met.

Didactical systems
A system can be seen as a set of related elements. Elements can be concepts, objects, subjects or a combination of these. Language is an example of a conceptual system. A falling apple under the influence of gravity is an example of a physical system where concepts and objects are connected through the laws of Newtonian mechanics. Systems are also made up of other systems which are called subsystems.

Some systems can be called teleological systems, meaning systems that pursue goals, like a soccer team that trains for an upcoming game or like a teacher who wants a group of students to learn something. Didactic systems are systems that involve persons with a didactic intent. These systems consist of subjects that pursue goals, which in this case, is defined by the learning objectives. Furthermore, didactic systems are not restricted to formal learning spaces such as classrooms. However, the didactic systems that are mainly considered here are those that exist in formal settings, for example, in institutions such as schools.

The client, the decision-maker and the designer
To create change through design, there must be a purposive individual who can produce alternatives that can potentially lead to his or her objectives (Churchman, 1971; Nelson & Stolterman, 2012). This must be someone with the 'ability to imagine that-which-does-not-yet-exist to make it appear in concrete form as a new, purposeful addition to the real world' (Nelson & Stolterman, 2012, p. 12). To set the stage, we can imagine three such characters: the client, the decision-maker and the designer. In this casting, the client is the one whose desires should be served by the system and who can be described in terms of his or her objectives or goals. The client's interest in these goals can be described by a 'trade-off' principle that tells us about the priority of different possible futures. The designer's responsibility is to imagine the client's goals, but as the designer's resources are limited, the client cannot expect to have it all. Instead, all the designer can do is to provide close approximations to these idealistic desires (Churchman, 1971).

While the designer and the client need to share the same value structure, the client and the decision-maker do not necessarily do so. The decision-maker character has a different role because he controls the resources within the environment. By this, he is part of creating the real design. The relationship between these three characters becomes even more intricate when realising that, in

real life, 'both client and decision maker are highly complex entities, made up of interacting forces' (ibid., p. 48). In addition, it is possible that all three characters reside in one person.

The designer engages in design efforts for the purpose of bringing change to an existing didactic system. The didactic system is also a teleological system concerned with learning. It includes teachers and students, and although learning in the didactic system is not restricted to students, it is the students that are the main targets of the didactic intent. In this sense, the didactic system serves the students, meaning that the students can be conceived of as the clients of the didactic system. The educational designer may share the didactic intent towards the students, but her efforts may not necessarily focus on the students. The designer may choose to address any actor of the didactic system (e.g. teachers). By including the didactic system as a teleological component, the students may remain as clients also within the teleological system of the designer. However, the teleological system must also be designed so it can serve the researcher as a client, as in, the researcher herself and her ambition to contribute to scientific knowledge. In this sense, the designer may interpret the situation not only as if there were two connected systems but also two clients, in particular, the students and the researcher (figure 1). Although teachers may not be explicitly considered as clients, they nevertheless have important roles in the teleological system, for example, as actors in the didactic system – in particular, the teaching system.
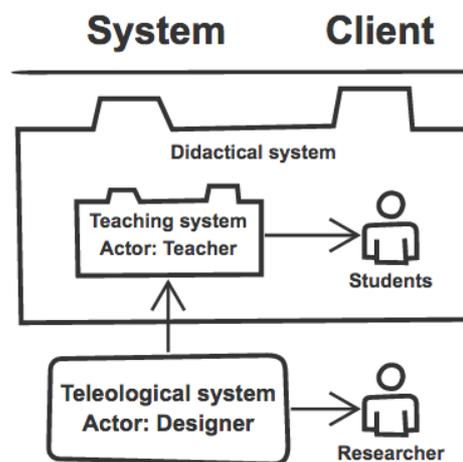

Figure 1: A design system and its actors

In this conceptualisation, the didactic system is considered as part of the teleological system in such way that the didactic system preserves its natural function even when embedded within the larger system of the designer. An alternative way is to conceptualise the didactic system as part of the environment of the teleological system. In this latter case, students are no longer clients unless

the designer and the teleological system take over the didactic intent. However, this means shortcutting the teachers' natural role within the teaching system.

Five roles of the designer

We can imagine that the designer's interaction with the client and the decision-maker can take different forms. Inspired by Nelson and Stolterman (2012), we consider five roles of the designer: the designer as artist, as expert, as facilitator, as provider, and as designer in service. The first four roles have individual merits and shortcomings that the fifth role, designer in service, attempts to exploit by assuming different roles during the design process. We proceed by presenting the four basic roles. Later in this section, we elaborate on the fifth role, designer in service.

Designer as artist

In this role, the designer acts as the sole owner of the design process. The client has little or no influence other than providing the designer with a relevant context. Furthermore, the designer as artist may not even be very interested in the desires or needs of the client. In this situation, the designer acts in a fashion more or less sufficient unto himself. The design solution is based on the designer's own judgements as an instance of artistic expression.

This means that in the role of designer as artist, the designer controls both the goals and the design process. Even if the designer and potential clients may share similar goals, we can assume that they are viewed from different perspectives, at least if we assume that the designer and the client are not the same person. There is no active match-making between the designer and the client. Any potential relevance or utility for a client would be due to the experience and skills of the designer to produce such results. In the worst case, relevance for practice would be more or less accidental or only due to chance.

Designer as expert

In this role, the client is not given the possibility to contribute to the design process. Although the client's goals may be considered, the designer is the one with predetermined insights and design solutions. No customised interactions with the client are needed, as the client merely acts on behalf of the initiatives presented to him/her.

In this case, the designer helps the client in the way that the designer believes is the most effective or worthwhile. The designer finds the mandate to do so from the effort that the designer has put into analysing the context and the design problem as well as the scientific knowledge that the designer brings into the situation. However, this is, by the very nature of helping, a one-sided relationship (Nelson & Stolterman, 2012). Furthermore, if the problem is correctly analysed according the designer's methods, the conclusions and solutions cannot be

regarded as incorrect. If the designer should fail to produce any useful and relevant outcomes, it could be blamed on interfering variables or on shortcomings in the client's implementation. If it is the latter, then the immediate solution could be to educate the client so he or she will become more proficient regarding the operationalisation of the designer's proposal.

Designer as facilitator
When the designer acts as facilitator, the client is expected to decide what goals should be pursued and what should be done. The designer acts merely to organise and to support the design process and does not contribute with new perspectives or new ideas.

In the role of designer as facilitator, the designer considers the perspective of the client. The designer allows the client to make use of his or her wide experience and 'real' knowledge in the design process. The client decides what goals to pursue for the purpose of achieving results with relevance for local practices. In this case, solutions reside within the current environment represented by the client. The designer's primary role is to facilitate any effort that the client suggests. The designer addresses issues of relevance and utility by giving the client authority to control goals and processes. In other words, the client is made responsible for strategic decision-making.

Designer as provider
In this role, the designer refrains from participating in the design process. As a provider, the designer acts only as an instrument by answering questions from an intentional client. In this case, the designer does not contribute intentionally to any part of the design process.

In this case, the client assumes total control over goals and processes. The designer provides support only when asked and in well-defined and limited issues (i.e. technical and scientific support). The designer relies on the client to know how to use the knowledge and tools that the designer has provided. Also, in this case, relevance seems to be secured, as the client is made responsible for deciding on both strategies and tactics.

Ethical considerations
Both the designer as artist and the designer as provider require only minimal interaction between the designer and the client. This minimal interaction may cause difficulties for the designer to develop sufficient understanding for making informed ethical design judgements, as the designer works in isolation with limited interaction with the client and other actors of the environment.

Furthermore, on one hand, the designer in the role of the designer as artist does not make the assurance that the knowledge produced can be understood or be used by a specific client for his or her purposes. On the other hand, in the role of the

designer as provider, the designer does not have insight in the client's design process and cannot be expected to judge if the solutions are generalisable beyond the immediate environment. In both cases, the knowledge produced is either the property of the designer or of the client. Each role focuses on esoteric knowledge rather than exoteric knowledge. In other words, the roles of the designer as artist and the designer as provider are self-serving rather than other-serving (Nelson & Stolterman, 2012). Thus, if dissemination is regarded as an important value of design, it may be lost with little chance of recovery.

In comparison, the role of designer as an expert or a facilitator may appear more appealing, as the control of goals and processes are shared between the designer and the client. However, the expert and the facilitator face other difficulties. The designer in the role of the designer as expert merely 'accesses the voice' of the client and does not pay sufficient attention to the client's needs. And the designer as expert could be accused of acting in a superior way that could cause a conflict between the values of the expert and the values of the stakeholders involved. If the designer as expert fails to produce results that the client understands, he or she may be criticised for using an insensitive top-down approach that does not account for the specifics of the situation.

The designer as facilitator also faces other problems. Unlike the designer as expert, the facilitator does not contribute with new perspectives because he relies on the judgement of the client to know what to do. The facilitator's may suggest design strategies based on the client's request. The client is responsible for risk-taking regarding design tactics and design solutions. Nevertheless, along with all the other characters, the designer as facilitator is responsible for how design activities may affect others; however, the facilitator does not engage in redirecting the client's actions. The designer as facilitator believes that no matter what happens, he or she should not interfere. Therefore, if something goes wrong, the facilitator could be accused of being, although presumably scientific objective, socially irresponsible. Furthermore, as no new inputs are introduced, the facilitator accepts the client's formulation of the situation. But the client's intuition may be misleading: The solution that the client implements may come at the expense of other goals that the client is not aware of and also not prepared to sacrifice. The passiveness of the designer as facilitator may worsen the situation for the client. The facilitator chooses to accept the client's perspective and does not engage in analysing the consequences of the client's design solution. This approach may risk contributing to the establishment of a recurring problem instead of engaging in resolving the problem and improving the design solution. The client is fully responsible for evaluating the design solution and its consequences.

The designer in service
In summary, none of these power relations between the designer and client are fully satisfactory, but nevertheless, they should not be discarded so easily. Thus

far, we have examined four out of five possible roles of the designer. The last role is the designer in service. This role represents an intricate relationship where both the designer and the client are engaged dynamically in the design process. This relationship involves switching between the four previous roles. In this sense, it is a balanced relationship between the designer and the client but still with the tensions of the other roles. The role of designer in service does not mean unconditionally accepting either proposed problem formulations or any initial ideas for solutions, as presented by the client or by other 'experts' of the environment (Nelson & Stolterman, 2012). The designer in service switches carefully between the four roles, purposively and intentionally rather than by decree. For some specific purposes or in some phases of the design process, the designer may momentarily assume the role of the artist, the expert, the facilitator or the provider to better understand and deal with a situation – to rock the boat, so to speak, but not in a harmful way. Rather, it is done carefully with the intention of negotiating and developing a mutual understanding of the design objectives and emerging issues in the design process. The tactic of merely asking what the client wants may not be sufficient, as it cannot always be expected that the client will know what he or she exactly wants or is capable of expressing it explicitly. Furthermore, '… the statement of needs and wants is often confused and frequently wrong, simply because statements of wants and needs serve so many different purposes for the individual' (Churchman, 1968, p. 181). Instead, the designer may act like the expert or the artist and introduce artefacts or other arrangements and, by getting his client to react to them, form a preliminary understanding of how well the design proposal fits in the environment. Which roles are relevant to assume in order to satisfy a design goal is the responsibility of the designer to decide in collaboration with the other actors of the teleological system. The designer and the other actors of the system may bring their own perspectives into their partnerships. In this sense they are equal partners, but as their access to social and or scientific resources may be different, they cannot always be expected to contribute in the same way.

Concluding comments

Every decision the designer makes, either to act or simply to observe, has the power to leave marks that could affect those involved in unexpected ways, for better or for worse. This is especially the case when the designer is dealing with educational problems that in many cases cannot be clearly defined in advance because they are imbedded in complex social systems (Berliner, 2002; Lesh & Sriraman, 2005). This is why the goal-seeking behaviour and the pursuit of 'ideals' necessarily involves an ethical dimension about the kind of results or knowledge the designer may produce. For example, should the designer prioritise his goal of producing theoretical results and produce scientific publications or should he

follow his goal of contributing to the practice? Of course, different designers may address these kinds of issues differently depending on the research context and his or her personal disposition. It is difficult for the designer to know what to do, when to do it and why he or she should do it because there are seldom standard procedures and tools ready to be used to address complex problems. Still, throughout the entire design process, the designer needs to decide what action to take. Even if decisions are not necessarily right or wrong, they may be good or bad for the teachers, students and other stakeholders that may be involved.

In educational design research, the standard procedure is that "a research team assumes responsibility for a group of students' learning" (Cobb and Gravemeijer 2008, p. 68). This suggest that the dominant role assumed in this tradition is designer as expert. A team design and implement teaching activities based on a selection of principles. Empirical outcomes are then analysed by the researchers by utilising predefined theoretical frameworks, with focus on describing and evaluating learning effects of the implemented activity. In order to create more successful innovation in education, perhaps other roles should also be considered. In the role of designer in service the participating teachers are more clearly positioned as designers and agents of change. By giving the teachers extensive responsibilities in the design process, they acquire design knowledge and control of the process. This may increase the possibility that people other than the researcher will also consider the design a good design.

Note

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