TEORIA FUNDAMENTADA NA PESQUISA EM EDUCAÇÃO EM DESIGN: lidando com problemas complexos

GROUNDED THEORY IN DESIGN EDUCATION RESEARCH: dealing with wicked problems

LIMA, Fabiane Alves de; MSc.; Universidade Federal do Paraná
fabianelim@gmail.com
CALOMENO, Carolina; Dr.; Universidade Federal do Paraná
carolcalomeno.ufpr@gmail.com

Resumo

Este artigo apresenta a aplicação do método Grounded Theory para pesquisas em ensino de Design. Este método de investigação surge da necessidade de analisar fenómenos sociais complexos em curso de forma organizada e estruturada, mas também exploratória. O método da Teoria Fundamentada nos Dados baseia-se em diversas fontes de informação, desde revisões de literatura tradicionais até entrevistas em profundidade com informantes que vivenciam a situação investigada. O objetivo deste método não é obter uma compreensão abrangente das questões que envolvem o problema de pesquisa, mas gerar conhecimento fundamentado e integrado. Neste artigo, expomos como funciona esse método, suas estratégias, protocolos e análises, desde a coleta de dados até como são feitos os processos de codificação, os memorandos são escritos, o banco de dados é construído e como esses processos combinados culminam no primeiro resultados teóricos. Trazemos também um breve panorama sobre a aplicação do método Grounded Theory na pesquisa em Design.

Palavras-chave: educação em Design; plataformização; problemas complexos; Teoria Fundamentada; métodos de pesquisa

Abstract

This paper presents the application of the Grounded Theory method for research in Design education. This research method arises from the need to analyse ongoing complex social phenomena in an organised and structured, but also exploratory way. The Grounded Theory method draws on various sources of information, ranging from traditional literature reviews to in-depth interviews with informants experiencing the investigated situation. The goal of this method is not to get a comprehensive understanding of the issues involving the research problem but to generate grounded and integrated knowledge. In this paper, we lay out how this method works, its strategies, protocols, and analysis, from data collection to how the coding processes are done, the memoranda are written, the database is constructed, and how those processes combined culminate in the first theoretical results. We also bring a short panorama about the application of the Grounded Theory method in research in Design.

Keywords: *Design education; platformisation; wicked problems; Grounded Theory, research methods*

1 Introduction

The infrastructural changes in the field of mass communication have brought not only new ways of communicating, but also teaching and learning Design. The new, more widely expanded, and loosely defined problems of the world today and its current affairs demand a methodological approach that can deal with these complexities. The Grounded Theory method (CHARMAZ, 2006; GLASER; STRAUSS, 2006) presents itself as a possibility to give robustness to design research. The intrinsically complex, hybrid, and ongoing problems and issues that can be solved by design practices can be understood beyond their technical possibilities. Researchers can benefit from this approach, encompassing with it the complexities of these research problems with aims to generate knowledge in an iterative and interactive process.

This paper presents an initial application of this method until the first results of its first iteration. Here, we outline the research problem, the Grounded Theory as a method to address its questions, the strategy necessary to answer them, what kind of data is being collected and analysed, as well as the necessary protocols for this collection and the primary results of this process. This research method arises from the need to analyse ongoing complex social phenomena and, from that analysis, generate substantive and contingent knowledge that can underpin the development of formal and more generalizable knowledge.

The Grounded Theory method draws on various sources of information, ranging from traditional literature reviews to in-depth interviews with informants experiencing the investigated situation. Its processes generate codes and categories that will aid in the construction of concepts. These concepts, articulated in textual form in memos, form the basic building blocks for knowledge construction — the grounded theory itself, generated from the cyclical succession of its methodological procedures. The theory constructed through the Grounded Theory method emerges from the empirical observation of the collected data. What ensures the strength of this method is the constant comparison between the gathered data and the generated concepts, in cycles that repeat with each new block of sifted information. It is an iterative process of data collection and analysis for qualitative research, using comparative and interactive analysis to conduct inductive-abductive research.

2 Dealing with *wicked problems*

This paper originates from research which addresses platformisation (POELL et al., 2019) and its issues regarding Design education. These platforms are manifestations of socio-technical processes, rather than mere artefacts, which necessarily places our research problem in the category of the “wicked problems” (RITTEL; WEBBER, 1973).

As a wicked problem, platformisation is an ongoing phenomenon; therefore, incomplete. Most analyses focus on organisational, communicational, and administrative aspects of its interactive technological manifestations. In other words, most scholars who have delved into platforms see them as artefacts, as *software*, but not as much as socio technical systems in use, hybrids of humans and non-humans (LATOUR, 2013). Studies focus on the possibilities of realisation through platforms, ways to make them more efficient, problems in their interaction designs, and user experience. But they do not focus as much on the role that platforms play as part of everyday social life, as tools of socialisation (MARTÍN-BARBERO, 1998).

Platformization, as a *wicked problem*, is also contradictory in its manifestations and consequences, due to its mutable nature. Its processes deeply affect education and work in

general, especially work and training in Design. While platformisation allows the expansion of education and work beyond the geographical borders of a given territory — or even the physical boundaries of the in-person and remote activities, and the temporal boundaries of synchronicity and asynchronicity —, it also technologically enables the creation of an environment conducive to the precarization of educational and professional activities (ANTUNES, 2020).

It can be challenging to try to understand how humans interact and engage in exchanges within socio technical systems beyond their quantitative and measurable aspects, those that cannot always be *datafied*. The focus on Design education, despite representing a limitation in scope, also presents its own complexities regarding research approaches.

Studying such a complex, ongoing, full of intertwinings, and numerous involved actors — that can or cannot be humans — phenomenon requires a research method that concentrates its strengths on comparative and interpretative analysis. The phenomenon of platformisation today affects almost all communicative instances of practical human life. Its dynamics, extensions, limitations, participants, and modes of operation organise its interactors at different levels within its socio technical network. Such a socio technical system demands a research method that appropriately addresses its human dimension.

The problem of this research is characterised as exploratory. This means it can be approached interdisciplinarly by various scholars with different perspectives and make use of various sources of information. Exploratory research problems are those where there are relatively few studies in the area, and where the boundaries of their variables are poorly defined (SANTOS, 2018).

To deal with *wicked problems*, it is necessary to adopt a research method that can handle their mutable nature, inherent entanglements, and subjective factors involved. These problems are complex because they are incomplete, contradictory, mutable, and full of interdependencies, for which there is no easy or necessarily correct solution. The Grounded Theory method was chosen precisely due to the need to address platformisation as a complex, *wicked problem*. The goal of this method is not to get a comprehensive understanding of the issues involving the research problem but to generate grounded and integrated knowledge.

3 The Grounded Theory method

The Grounded Theory method emerges from the need to analyse ongoing complex social phenomena and generate knowledge and understanding about a specific research question. It originated in the midst of the epistemological discussions of the 1960s, criticising the predominantly verificationist stance of positivist-oriented social research (GLASER; STRAUSS, 2006). Paradoxically, over the years, this method had been praised precisely for its rigour, as some strands of the method adopted a verificationist stance, as is the case with the version developed by Strauss and Corbin (1990).

The Grounded Theory method was created with the intention of aiding the generation of high-quality theory in social research. Its more recent versions do not see the researcher as a separate entity from the data she collects but as an active and participative agent in the construction of knowledge (CHARMAZ, 2006). The Grounded Theory principles are more like practical lines of action for research than strict guidelines or recommendations.

The Grounded Theory method is essentially qualitative, as it deals with qualitative and

textual data. This method intends to generate knowledge to develop theories that can lead to the formulation of hypotheses from its data; there is no intention to test hypotheses or conduct numerical or statistical data surveys. Therefore, this method has an exploratory approach. However, quantitative data are not entirely dispensable: existing surveys and reports can help interpret and clarify phenomena in the field, as they assist in understanding the context and informing the researcher about the research topic.

The reasoning logics of the Grounded Theory method are the abductive and the inductive. Inductive logic aims to generate theory underlying the phenomenon, making generalizations investigating particularities. Inductive logic recognises that the phenomenon is grounded in experience and that its understanding is based on observation. On the other hand, abductive logic is propositional: it generates value from established relationships and is implicitly associated with the so-called *wicked problems*.

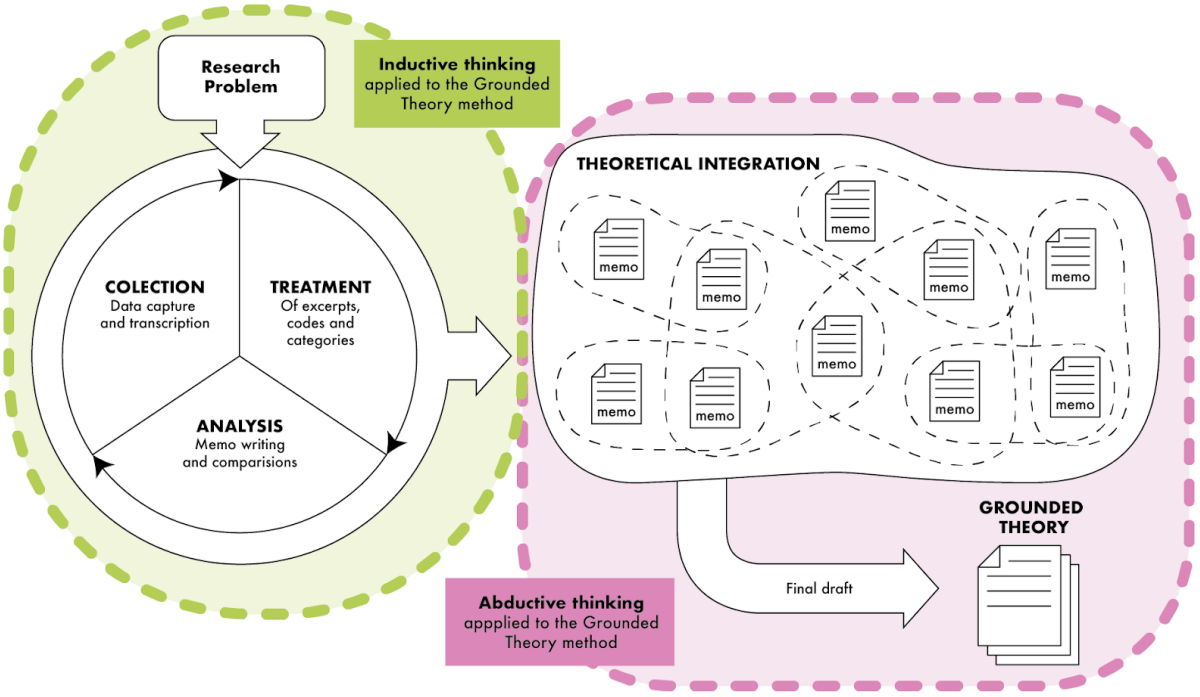
This method employs constant comparative analysis performed iteratively. The codes and categories generated during the data analysis are constantly compared with each other to generate frequent insights into the investigated subject. Data collection and analysis are not limited to specific, separate moments of the research. These phases are conducted constantly and concurrently in iterative stages that repeat until the understanding of the subject has reached what the original developers of the Grounded Theory method call “theoretical saturation.”

Furthermore, research conducted with Grounded Theory has a deeply interactive and interpretative character. Originating from Sociology and symbolic interactionism, the Grounded Theory method assumes that it is through the procedure that the researcher generates the understanding of the phenomenon. The researcher delves into the search for patterns of informants’ behaviour through the study of the interrelations of meaning in the subjects’ perception and actions, and in the analysis of the experiences of people involved in these processes, thereby generating knowledge about the studied phenomenon.

3.1 **Strategy**

The research strategy within the framework aimed at building Grounded Theory has two crucial moments: 1) the cyclical and iterative phase of data collection, processing, and analysis, and 2) the phase of textual synthesis, when the researcher effectively produces the theoretical (textual) results of the research. As this second phase of textual synthesis unfolds, it may require new forays into the cyclical phase.

Figure 1 - Procedures for Grounded Theory Construction



Source: the author.

In this method, we capture data from various sources: they can include transcriptions of in-depth interviews, academic texts, advertising texts, historical documents, etc.; however, their ultimate embodiment is in textual form. These data are then separated into excerpts, which are subsequently annotated and coded — open, axial, and/or focused — from which the researcher will generate categories and concepts that they will instrumentalize in later analysis.

The analysis phase is characterised by the writing of memos and the constant use of the comparative method. Writing memos is a moment where the researcher can write more freely about the themes that will emerge from the data, but they also serve as drafts and aids for the future theory being sought. It is through the constant comparison between categories that ideas can solidify and integrate in a theoretically coherent manner. As the analysis progresses, the researcher may assess through it the need to return to the field to better characterise emerging categories, to identify new categories and codes, or to clarify concepts and discovered knowledge.

Once the researcher has successfully synthesised in their textual memos the themes of their investigation with sufficient density to achieve what Glaser and Strauss (2006) called “theoretical saturation” — i.e., the moment when collecting more data no longer contributes to revealing new properties of the theoretical categories —, they can dedicate themselves to integrate these ideas and produce the grounded theory itself. The final writing of this whole work is the end product of the research conducted by the method outlined here.

The focus of our analysis is on understanding the actions and impressions — i.e., the experiences — of human interactors in Design teaching and learning processes on digital communication platforms. These experiences will be crystallised in text through the transcription of reports and interviews, which will be conducted with informants who agree to participate in the research. Initially, the criteria for enrolling these informants are quite broad — individuals involved in Design education through platforms, both within and outside universities; as the research and analysis progress, more participants may be invited to report their experiences. These interviews

will be conducted in a posterior moment in this research and the material regarding them are not included in this sample.

In addition, textual materials of various kinds also serve the present analysis, such as academic texts and scientific papers, historical documents, and advertising materials, both printed and digital. The objects of analysis here are the meanings that emerge from the texts, and these various other materials assist in understanding the meanings present in the statements provided by the research informants. They can also serve as sources of categorizations and conceptualisations in their own right, not just as a complement to other statements and excerpts.

Several thematic axes help delimit the unit of analysis, allowing the research to remain focused and the resulting analysis to not fragment excessively: the design of design education; platformisation as a socio technical process; media, their languages and mediations; and education as experience. These axes will serve as starting points, acting as "sensitising concepts" (GLASER; STRAUSS, 2006) for data collection. Although research using the Grounded Theory method tends to avoid literature reviews at the beginning of their endeavours and leaves that part of the research for the end, the researcher's stance here is more of "theoretical agnosticism" than "*tabula rasa*" (CHARMAZ, 2006): the researcher understands that there are various different perspectives on the topic, but instead of choosing one of them and building methodological tools of action from there, they want for these perspectives to emerge from the data. At a later stage, the research can compare these existing perspectives and the theory constructed from empirical evidence.

3.2 **Protocol**

The nature of the data analysed in qualitative research is generally textual. Texts encapsulate ideas, concepts, and impressions. Precisely due to the ambiguous nature of text — they are constructions located culturally and temporally through a system of graphic signs, etc. — they require certain precautions in their collection and treatment. There are at least two types of texts to be targeted for qualitative analysis, as employed in the Grounded Theory method (CHARMAZ, 2006): the elicited and the existing. The elicited texts involve the participation of research informants in their construction. They can result from transcriptions of the participants' speeches or even be written in their own handwriting. The existing texts, as the name suggests, are ready-made texts produced by actors other than the researcher and the research participants. They can be articles, reports, news, advertising materials, or any other textual material that the researcher believes is interesting to include in their sample.

Procedures employed in literature reviews — whether systematic or unsystematic, such as note-taking and annotations — can also assist in selecting textual excerpts for interpretative analysis, such as books and scientific publications. These materials also provide a series of data related to their format — editorial publications, periodic or not, for example — that can be analysed and compared in various ways.

It is necessary to use appropriate tools for collection and treatment of elicited textual data, specifically those arising from transcriptions of in-depth interviews. In this case, the guidelines of the ethnographic method — specifically those focused on investigating phenomena involving mediation by technological artefacts, such as Miller and Slater (2001) — can be useful. Conducting ethnographies allows for a better understanding of the environments where people interact, as well as the actors themselves. The ethnographic method, as a data collection technique, provides

guidelines for the researcher, directly involved in the research context, to explore the subject and collect high-density information.

Ethnography can be applied as a research technique in Grounded Theory. This way, the researcher's role varies according to their relationships with the informants, as an active participant in the study. The priority is to investigate processes and phenomena, not on descriptions of scenarios. A potential problem in ethnographic work is seeing data everywhere and not being able to collect it; this problem can be addressed with comparative analysis applied from the beginning of the research process. This constant process of data collection and analysis also helps in motivating the researcher, as it narrows the thematic scope, putting theory against data.

For the data collection to be successful, it is necessary to collect as much as possible to fulfil the task required in the research objective. These data should be about the actors, processes, and scenarios, about their views and actions; they should reveal things beyond what is apparent and give the researcher a multiple perspective to help in developing analytical categories. To ensure the quality of these data, the researcher can, after transcription, contact the interviewees and ask them to review the transcription and make changes as they see fit.

3.3 **Analysis**

The data analysis, according to the Grounded Theory method, is not a separate moment in the research but a procedure to which the researcher constantly and iteratively returns, along with the other phases of data collection and treatment. This continuous cyclical movement allows the analysis to be gradually enriched or adjusted as new data is discovered and becomes part of the sample.

The analysis phase begins as soon as the categorisation and coding procedures for the qualitative data are completed. In this phase, these qualitative materials are annotated and classified according to categories that emerge from the researchers' own contact with them and the interpretations resulting from this contact. These interpretations are recorded in memos, which can be understood as reports or field diaries, where the researcher engages in reflective exercises to think about the ideas that emerge throughout the research. These memos play a fundamental role in integrating the analyses and generating the theoretical conceptualisations that will constitute the final manuscript of the research. However, until the researcher reaches the stage of exhausting their analytical categories, they must return to the field to collect more data.

The organisation of this data can be done using specific digital tools for this type of technique, such as software for qualitative data analysis like RQDA, QualCoder, NVivo, and MAXQDA. Tools for the construction of knowledge databases, such as wikis and Zettelkasten engines, can also be used. Such tools allow the organisation of documents into databases that can relate categories and codes quickly and conveniently, using keywords or even relationships that the researcher can construct and establish manually. The use of these tools already has a good tradition in the field of Social Sciences.

The analysis itself must be conducted in a comparative, iterative, and interactive manner: the constant comparison between the codes and categories generated from the data facilitates the integration of ideas and the generation of hypotheses in Grounded Theory. Interpretations are created through interactions with the environment and actors. Research with more objectivist tendencies tends to conceal its interpretative nature through the use of abstractions. However, researchers are always involved *within* the research process, not above or outside of it (CHARMAZ,

2006).

Generalisation is possible through the Grounded Theory method, but it emerges from the analytical process rather than being its objective. The researcher's involvement in the research topic can help identify the limitations of categories and the possibilities of generalisation. Aiming building knowledge from comparative qualitative analyses, the chosen research method, Grounded Theory, has iterative cyclical phases and relies on essentially textual material collected and transcribed from various sources. This analysis starts from sensitising concepts, established as theoretical starting points to guide the research towards new categories and codes that will help unveil the raised questions. These codes and categories can be organised in an electronic system for qualitative data analysis, but the final form of the research results is also textual.

4 First results

The Grounded Theory method applied in this research comprises iterative phases that encompass and integrate data collection, treatment, and analysis processes (CHARMAZ, 2006; GLASER; STRAUSS, 2006). As these procedures have constant and reiterated cyclical application, their execution in the initial stages of the research provides crucial insights into the success of the overall investigative process, allowing the researcher to correct the course if necessary, expand or narrow down the scope of addressed themes, and adjust what is not working satisfactorily.

This method allows various types of data to be embraced within its scope, as it takes data of multiple nature for analysis, regardless of format, textual complexity, or physical and media incarnation. Accommodating this variety of information sources, this research has a heterogeneous set of data that needs to be sifted, processed, and sometimes retranslated — remediated (BOLTER; GRUSIN, 1999) — into other formats. These remediations manifested in the form of raw data tabulations, thematic bibliographic surveys, in-depth readings that generated extensive detailed annotations, bibliographic excerpts, diagrams, and visual representations, synthesis tables, comparative tables, etc.

The application of the method in this initial phase was heavily inspired by bricolage (RODRIGUES et al., 2016). This scientific-creative practice gained significant space in recent educational research, proving to be an interesting way of investigating and reflecting on complex topics. In contrast to the Grounded Theory method, both share a similarity in their proposal of constructing and creating science, but Grounded Theory has a much more structured and organised character than the form of understanding offered by bricolage. However, the openness to serendipity embedded in the bricolage process and its highly multi referential approach assisted the researcher in the initial decisions regarding the selection and treatment of the first investigated codes, as well as in capturing and developing the initial emerging ideas from these data.

The inspiration from bricolage allowed themes and processes to be explored, enabling the research to begin before the choice of a more appropriate research method. Initially, we explored the possibility of using various research methods and their combined techniques. However, the three chosen methods — systematic literature review, surveys, and ethnographic methods —, coming from different traditions, required many adaptations to work together smoothly while lacking specific tools to handle the generalisations and particularizations that the collected data could provide for the theorizations, which are the aim of this research. Once the Grounded Theory method was chosen, the research work could proceed more smoothly.

All the material collected and assembled in these initial data surveys represents only a small

part of the total potential that can be gathered in an investigation of this kind. However, it constitutes a sufficient text sample to demonstrate at least one complete iteration of the Grounded Theory cycle.

4.1 **Coding**

As the research database grows in complexity and size, other associations may be possible, while others may change as new data is added to it. Categories emerge from this tangle of associated ideas, represented by the codes attributed to them. Once this data spreadsheet can be manipulated via suitable qualitative data analysis software — such as Obsidian (https://obsidian.md/), used in this research — the ways of relating these codes and data into categories can happen more swiftly. The lack of this software infrastructure does not hinder the research; however, it is important to remember that the Grounded Theory method, even though it currently benefits from computational tools, originated in a world where they were not as accessible (GLASER; STRAUSS, 2006).

There are at least three ways of coding data in Grounded Theory (GLASER; STRAUSS, 2006; CHARMAZ, 2006): open, axial, and focused/selective. With open coding, the researcher attaches ideas to the excerpts in a looser way, yet without the intention of associating them in clusters. With focused or selected coding, the researcher starts to make sense of her collection of labelled ideas, narrowing down her codes and even rewriting its attached memoranda when necessary. With axial coding, the researcher draws connections between codes.

Other schools of Grounded Theory can also describe other ways of coding or even disagree with the nomenclature and procedures presented here (CHARMAZ, 2006). But the general idea behind the whole coding process is that excerpts should be labelled with codes that synthesise what is being said in that data extract. This code is then grouped with similar ideas that form a concept. Concepts are attached to categories that form themes, “the highest level of abstraction” (QURESHI; ÜNLÜ, 2020).

Categories can be organised hierarchically: groups of categories can form other categories or themes, connecting ideas in a network. However, all these relationships need to go through another translation process: the process of writing memos, which will help transform this set of qualitative information into linear running text. Although the ideas contained in the memos emerge directly from the categories and their codes — which, in turn, emerged from empirical data — the memos can also function as a research diary, as reminders and notes for the researcher, serving as places for exercising reflections on the research in a more free and less structured manner than in the common academic text.

The nature of memo text is loose, so researchers can often choose to “clean up” some of their memos when sharing them with other researchers. They can also opt to keep part of their memo collection private (CHARMAZ, 2006).

4.2 **Emerging ideas**

The initial data collection, reported in the previous sections, demonstrates how this process unfolds within the selected research method. It also allows the emergence of some of the first ideas that may shape the final version of the grounded theory that will emerge from this work. These ideas enable other possible paths of analysis based on the clues they point out, the practices

that inform them, and the foundations that generate and underlie their assumptions. Board 1 summarises these ideas, discussed in more depth below:

Board 1 - Emerging ideas from the first iteration for the future grounded theory

 **Community of practice**	The nature of knowledge is explicit and implicit; learners learn by observing and copying their peers.
 **The project as Design's final aim**	The designer's abilities in building projects are viewed as what qualifies them as a designer.
 **Dichotomy between reason and sensibility**	Very present, marks conflicts and historical vocations in the area.
 **Technological determinism**	Technology is understood as a driving force in the Design field.
 **Design and direct social intervention**	Interventions in Design education have direct effects in society as a whole.

Source: the author, with pictograms from Flaticon.com.

Some of these ideas appear in their more strict and delimited form in some of the materials surveyed, while in others, they arise in a less explicit manner but are still present. In general, one of the key points regarding the themes and processes that appear in this data collection relates to the nature of the practices and knowledge operated in the field of Design. As an area with high interdisciplinary permeability from inside out and from outside in, Design consolidates diverse knowledge and applications to achieve its objectives. Thus, knowledge in Design presents itself implicitly (tacit) or explicitly (articulated and declared), but depends on and builds within the collectivity of its community of practice: students learn by doing and observing, materialising this experience in the form of creative, critical expressions, and/or in the search for problem-solving solutions.

Even though some recent theorisations think of Design beyond its projective and professional dimension, it is towards this dimension that most research on education in the field turns: the designer's competencies in carrying out projects qualify them as professionals. Thus, the project is still the final goal of the design activity. The project — whatever type it may be: services, everyday use products, informational products, etc. — embodies a demarcable end, a territory that is still possible to delimit. However, the idea of a "project" may not be sufficient to encompass the proposals of the "wicked problems" that designers are now invited to solve.

Both the issue of the nature of their practices and the nature of their results are related to the historically known dichotomy between the rational and the creative thinking that permeate the teaching of Design since its institutionalisation. This dichotomy marks the traditions, programs, and individual vocations of each school, how teachers approach their disciplines, teaching and learning strategies, the working style of students before and after graduation, and even the designers' perceptions regarding the different skills and study paths available. This dichotomy is sometimes seen as a conflict, but it can also be perceived as an intrinsic strength or skill of those who choose this field.

The issue of technology emerges in the dyad between reason and sensibility. Even when it is claimed that "technologizing" stances can be detrimental to understanding the practice of Design, at the same time it is still considered a driving force of the field, capable of determining or guiding it in its priorities or ways of doing. This probably occurs due to the interdependence of the professional practice of Design and its productive methods. Although individual designers may act in more insurgent and subversive branches, their activities are conditioned by a broader market, based on the society in which they live and which provides their means of work. At the same time, both this "market" and technology can appear in the excerpts almost as an entity with its own intentions, abstracted by the different mediations it contains.

Another important idea that emerges from these early surveys is Design as a practice that directly affects society. This immediate intervention is seen as a powerful potential of the field, capable of turning it into an agent of social transformation. This is much more present in the research published by scholars working in higher education than in the commercial statements of platforms, which are more concerned with portraying Design and its practitioners as individual creative geniuses. Researchers show an awareness that interventions in education have direct consequences in professional practice and, consequently, in society as a whole.

4.3 **Memoranda**

The writing of memoranda is the intermediate step between the final writing of Grounded Theory and the data collection in iterative cycles. From a methodological perspective, from data collection to analysis, the research takes on an inductive character, and through the practices contained in this iterative cycle it underlies knowledge from a collection of previously unintegrated data. It is in writing memoranda that the research acquires its abductive character, creating explanations from this repertoire of collected and sorted data, proposing new knowledge.

One can start this writing by commenting on the found codes and concepts, with loose comments in a format more akin to a research diary or by organising these memoranda in the form of linear entries. The writing of these materials develops concurrently with other moments of the research and continues until its end. Putting information on paper helps the researcher make her work more concrete and consistent.

However, writing memoranda is not like writing a scientific-academic paper. Its language can be more flexible and free from its formal conventions. It can contain the researcher's personal observations about specific and punctual issues throughout the process, and can even be more spontaneous. Made for personal use, these materials help the researcher to explore ideas about the sorted categories and aim at data treatment; their function is not to establish external communication with an audience.

Memoranda can be composed through free writing techniques or through mind mapping

— a technique also called *clustering* (CHARMAZ, 2006), which relates ideas visually. It is through the writing of memoranda that the researcher can better establish her categories, elevating them to the conceptual level from focused coding. Through categories and codes, the ideas, events, and processes can be explained in understandable terms.

4.4 **An hipertextual database**

The organisation of codes and categories generated from analysis in a research study using the Grounded Theory method can be done in various ways. As mentioned earlier in this work, this research method allows the construction of the database for its application and implementation in many forms, ranging from a physical collection of handwritten note cards to an electronic database built on specialised software for QDA, an acronym for qualitative data analysis.

Given the need to create relationships between different categories and codes emerging from the data, regardless of how they are structured in practice, this database will necessarily be hyper textual. However, even forms of organising qualitative data inspired by old-fashioned paper card boxes allow the flexibility and agility of hypertextuality, especially when applied digitally. An example is the Zettelkasten (SASCHA, 2020), a system for note-taking and organising personal knowledge bases created in the early 20th century that can be applied using software such as Obsidian, which also allow managing content in wiki format, establishing relationships between different entries through links.

The choice between one or another way of organising this data will depend on several factors, including the value of licences for paid electronic tools, their features, technical possibilities and limitations, as well as practical and hardware-related issues for the researcher. For the present research, we chose the software Obsidian for it creates graphs showing the visual linkage between ideas and concepts.

4.5 **Results in a nutshell**

The emerging ideas from this research help to contemplate some of the possible themes and future directions for this investigation. They also assist in considering the present research in conjunction with other actors involved, be it the evaluating board or the informants who will be enlisted and interviewed soon.

Although deeply rooted in the text, the Grounded Theory method not only provides a way to handle this kind of knowledge but also a way to construct and express the implicit knowledge emanating from this data. The method also allows this research to be in line with assumptions of Design as a practice, enabling the construction of knowledge through action from the design practices that arises from the need to develop a knowledge base.

Wicked problems require methods that, when put into practice, embrace their specificities, entanglements, difficulties, and inherent complexities. By addressing the problem dealt with in this research with the procedures of the Grounded Theory method (CHARMAZ, 2006; GLASER; STRAUSS, 2006), we hope to unveil the teaching and learning experiences in the environments provided by the platforms and their processes, generating empirically and conceptually integrated knowledge at the end. The different cyclical phases of data collection, processing, and analysis allow the development and application of this method to yield almost immediate analytical results.

5 The Grounded Theory method in Design Research

Most research regarding Grounded Theory in Design compare it to other well known and well established methodologies applied in Design research and prototyping: design science research (GREGORY, 2010; MÜLLER; OLBRICH, 2011) and design research (NUNES, 2013; CLAASE, 2012), design and development research in human-computer interaction (DE VILLIERS, 2005), Design ethnography (WHITE; DEVITT, 2021), design thinking (BRAUN; CLARKE, 2021), and thematic analysis (BRAUN; CLARKE, 2021).

Other methods cited by those authors include action research, Agile, and participative design. Other studies deal with Grounded Theory applications in the field and their surroundings and its combination with other methodological approaches, like: urban planning (ZAMANI; BABAEI, 2020), automobile modification (ÜLKEBAŞ, 2014), pedagogical applications in the classroom (COMPTON; BARRETT, 2016), educational research (CHONG; YEO, 2015), architecture and design (BOLLO; COLLINS, 2017), User Experience (KHAMBETE; ATHAVANKAR, 2010), for PhD students (THURLOW, 2020), and as a design practice (FRIEDMAN, 2008).

Generally, those works deal with methodological differences and similarities between the different approaches in comparison, but some of them are also worried about how the Grounded Theory method itself is applied and used by researchers. Zamani and Babaei (2020), for instance, review the application of the method in more than forty studies. The authors found that many of those studies only describe some aspects of how the method is used, with little to no detail about how their authors came to the sensitising concepts or how they used the methodological research principles of Grounded Theory. Most of the studies reviewed did not present a proper theory at the end, limiting themselves to descriptions of general themes. Many are inconsistent regarding the use of terminologies and/or do not explicitly adhere to a specific line or application of the method.

Some studies see in Grounded Theory a promising possibility to scientifically improve theory generated in Design, but they also warn against the ways the method is applied without the focus on producing theory, its main goal. Müller and Olbrich (2011) points out how many of the theory produced in some studies remain in the early stages of its development, while Friedman (2008) highlights a common misconception between designers, that mistake the explicit and reflexive knowledge aimed by the construction of a theory with the tacit knowledge engendered in the design practice; this author criticises the notion of “research by design”, because although the expression is widely used, it is not defined what exactly is meant by it.

6 Reflexions on the work so far

This work is a snapshot of an ongoing research project. Like a snapshot, it captures the moment when its research method was defined, when it took its first empirical steps and presented its initial analytical results. As a study addressing a *wicked problem*, a highly mutable and structuring process like platformisation, its main strength lies in its focus. Investigating practices and experiences of students and educators in platform-based education might have become a common interest among researchers in education of all kinds recently, but Design education through platforms is still uncharted territory.

Platformization as a socio-technical phenomenon, while not deterministic, conditions important aspects of cultural and symbolic exchanges in its environments and interface encapsulations. In education, it has been a tool for the fragmentation and despecialisation of

professional activities not only for teachers but for the designers involved in its socio technical production. A portion of the workforce that produces, operationalizes, and enables the functioning of platform materials and tools adopts Design as its field of action, acquiring its professional training in formal or informal institutions. The issue raised by platformisation permeates Design as much as Design permeates the platforms.

The sensitising concepts that served as starting points for the initial theoretical reflection of this work help channel the research toward its specific objectives. Thinking Design education as an experience and the platformisation phenomenon as a type of cultural mediation allows placing the participants in these processes at the centre of the investigation: it is through this lens that we can understand the human relationships that occur there without ignoring the role of media that mediate these exchanges.

This theoretical framework, in turn, is temporary: the writing of a Grounding Theory is a later stage of research guided by the Grounded Theory method. This subsequent construction serves as a way to validate its results, comparing the generated knowledge with the current knowledge, raising points of contact and divergences. However, it also helps in articulating these knowledge and concepts cohesively, composing a substantive theory for this particular *wicked problem*.

Platformization, being a process of mediation exercised on platforms, translates communication between its various instances into its own languages and protocols. Platforms provide intelligibility but also promote deterritorialization and precarisation of essential professional activities. Platformization, as a concept, unveils the actions of media but also warns us about thinking of them as absolutely totalizing processes: rather, it reminds us of the socio technical nature of this complex problem, its hybridism between technology and society, and the impossibility of thinking of platforms without the society that designs, builds, maintains, and, when possible and/or necessary, repurposes them.

Whether mediated or immediate, education is a form of experience. As an experience, it is a contextualised action. Different from the so-called “user experience,” the experience here is immeasurable, just as its effects are immeasurable; experience cannot be *datafied*. This does not mean that it cannot be investigated empirically in a qualitative way: if experience is what passes through us and leaves traces in our memories (LAROSSA, 2002), it can be rescued, remediated in testimonies, and verbally coded.

Direct human participation is essential to fulfilling the objectives of this research. The analysis of the data collected via interviews can complement — and perhaps even call in question — the knowledge on the subject found in journals and research databases. Therefore, the synthesis of the knowledge explicit in researchers’ articles and books, with the implicit knowledge and experiences of people directly involved in Design teaching and learning processes are essential for the grounded theory to emerge in this work. So far, as reported previously, this research has used existing texts to raise its sensitising concepts, categories, and codes. These initial data collections helped fine-tune the methodological processes and matured its unfolding, with a conscious and assumed theoretical and conceptual bricolage.

The theoretical construction of the research, although requiring a separate moment of reflection, is done concurrently with the cycles of data collection, processing, and analysis within the logics of Grounded Theory. The themes listed here, however, do not restrict or definitively delimit the research scope. On the contrary, they point to interesting investigative directions within the network of relationships that it aims to construct.

Being a cyclical and iterative method, the process reported in this work will be continued until it reaches what their authors call “theoretical saturation”. Defining whether the research has reached this moment is a decision of the researcher, but it can be conditioned by several factors: the repetition of certain patterns when collecting data, it cutouts and the scope of the research, as well as practical factors — such as the available time to conduct the project — can influence this decision.

7 References

ANTUNES, Ricardo. **O Privilégio da Servidão**: o novo proletariado de serviços na era digital. Segunda edição. São Paulo: Boitempo, 2020.

BOLLO, Christina; COLLINS, Tom. “The Power of Words: Grounded Theory Research Methods in Architecture & Design”. **ARCC 2017 Conference**. Salt Lake City, 2017. Available at: https://www.brikbase.org/sites/default/files/ARCC2017_Session2A_Bollo_Collins.pdf. Access: June 10th, 2024.

BOLTER, Jay David; GRUSIN, Richard. **Remediation**: Understanding New media. Massachusetts: MIT Press, 1999.

BRAUN, Virginia; CLARKE, Victoria. “Conceptual and Design Thinking for Thematic Analysis”. **Qualitative Psychology**. V. 9. N. 1. 2021. p.3-26. Available at: https://psycnet.apa.org/doiLanding?doi=10.1037/qup0000196. Access: June 10th, 2024.

CHONG, Chee-Huay; YEO, Kee-Jiar. “An Overview of Grounded Theory Design in Educational Research”. **Asian Social Science**. V. 11. N. 12. 2015. Available at: https://www.ccsenet.org/journal/index.php/ass/article/view/48400. Access: June 10th, 2024.

CLAASE, Marcella. **Optimizing feasibility studies: Based on a Grounded Theory type comparison of feasibility design research**. Bachelor Thesis. University of Twente. 2012. 26 f. Available at: https://essay.utwente.nl/61979/. Access: June 10th, 2024.

COMPTON, Mike. BARRETT, Sean. “A Brush with Research: Teaching Grounded Theory in the Art and Design Classroom”. **Universal Journal of Educational Research**. N. 4. V. 2. p. 335-348. 2016. Available at: https://files.eric.ed.gov/fulltext/EJ1089674.pdf. Access: June 10th, 2024.

DE VILLIERS, M.R. (Ruth). “Interpretive Research Models for Informatics: Action Research, Grounded Theory, and the Family of Design- and Development Research”. **Alternation**. V. 12. N. 2. 2005. p. 10-52. Available at: https://journals.co.za/doi/pdf/10.10520/AJA10231757_388. Access: June 10th, 2024.

FRIEDMAN, Ken. “Research into, by and for design”. **Journal of Visual Arts Practice**. V. 7. N. 2. 2008. Available at: https://codecamp.com.br/artigos_cientificos/Research-into-by-and-for-design.pdf. Access: June 10th, 2024.

GLASER, Barney; STRAUSS, Anselm. **The Discovery of Grounded Theory**: Strategies for qualitative research. Londres: Aldine Transaction, 2006.

GREGORY, Robert. “Design Science Research and the Grounded Theory Method: Characteristics, Differences, and Complementary Uses”. **ECIS 2010 Proceedings**. N. 44. 2010. Available at: https://aisel.aisnet.org/ecis2010/44/. Access: June 10th, 2024.

HARMAZ, Kathy. **Constructing Grounded Theory**: a practical guide through qualitative analysis. Londres: SAGE Publications, 2006.

KHAMBETE, Pramod; ATHAVANKAR, Uday. "Grounded Theory: An Effective Method for User Experience Design Research". **Design Thoughts**, 2010. p. 11-24. Available at: http://www.idc.iitb.ac.in/resources/dt-aug-2010/Grounded%20Theory.pdf. Access: June 10th, 2024.

LARROSA, José Buendía. "Notas sobre a experiência e o saber de experiência". Translation by João Wanderley Geraldi. **Revista Brasileira de Educação**. N. 19. April 2002. P. 20-28. Available at: https://doi.org/10.1590/S1413-24782002000100003. Access: June 10th, 2024.

LATOUR, Bruno. **Jamais fomos modernos**: ensaio de antropologia simétrica. Tradução de Carlos Irineu da Costa. Terceira edição. São Paulo: Editora 34, 2013.

MARTÍN-BARBERO, Jesús. **De los medios a las mediaciones**: Comunicación, cultura y hegemonía. Quinta edición. Ciudad de México: Ediciones Gustavo Gili, 1998.

MILLER, Daniel; SLATER, Don. **The Internet**: an ethnographic approach. Nova York/Oxford: Berg, 2001.

MÜLLER, Benjamin; OLBRICH, Sebastian. "The Artifact's Theory - A Grounded Theory Perspective on Design Science Research". **Wirtschaftsinformatik 2011 Proceedings**. Zurich, 2011. Available at: https://aisel.aisnet.org/wi2011/55/. Access: June 10th, 2024.

NUNES, Moema Pereira. "A Utilização Conjunta da Grounded Theory e da Design Research. Uma Investigação na Área de Suprimentos". **Revista Latinoamericana de Metodología de la Investigación Social**. N. 6. V. 3. Buenos Aires, October 2013. Available at: http://www.relmis.com.ar/ojs/index.php/relmis/article/view/utilizacao_conjunta. Access: June 10th, 2024.

POELL, Thomas; NIEBORG, David; VAN DJICK, José. "Platformisation". **Policy Review**: concepts of the digital society. V. 8. N. 4. April 2019. Available at: https://policyreview.info/concepts/platformisation. Access: June 10th, 2024.

QURESHI, Henna A.; ÜNLÜ, Züleyha. "Beyond the Paradigm Conflicts: A Four-Step Coding Instrument for Grounded Theory". **International Journal of Qualitative Methods**, 19. Available in: https://journals.sagepub.com/doi/10.1177/1609406920928188. Access: June 10th, 2024.

RITTEL, H. W.; WEBBER, M. M. "Dilemmas in General Theory of Planning". In: **Policy Sciences**. 4. 155-169. 1973. Available at: https://link.springer.com/article/10.1007/BF01405730. Access: June 10th, 2024.

RODRIGUES, Cicera Sineide Dantas; THERRIEN, Jacques; FALCÃO, Giovana Maria Belém; GRANGEIRO, Manuela Fonseca. "Pesquisa em educação e bricolagem científica: rigor, multirreferencialidade e interdisciplinaridade". **Cadernos de Pesquisa**. V. 46. N.162. Outubro/Dezembro de 2016. P. 966-982. Available at: https://www.scielo.br/j/cp/a/Lm5MCLHGmLMhNsGTdBTKrWG/?lang=pt&format=pdf. Access: June 10th, 2024.

SANTOS, Aguinaldo. **Seleção do Método de Pesquisa**: guia para pós-graduando em design e áreas afins. Curitiba: Insight, 2018.

SASCHA. “Introduction to the Zettelkasten Method”. **Zettelkasten.de**, 27 de outubro de 2020. Available at: https://zettelkasten.de/introduction/. Access: June 10th, 2024.

STRAUSS, Anselm; CORBIN, Juliet. **Basics of Qualitative Research**: Grounded Theory Procedures and Techniques. Londres: SAGE. Publications, 1990.

THURLOW, Lisa. “Grounded theory and the PhD – notes for novice researchers”. **Journal of Humanities and Applied Social Sciences**. V. 2. N. 4. 2020. p. 257-270. Available at: https://www.emerald.com/insight/content/doi/10.1108/JHASS-05-2020-0079/full/html. Access: June 10th, 2024.

ÜLKEBAŞ, Selen Devrim. “The Use of Grounded Theory in User Experience Based Design Research: A Study on "Automobile Modification" in Turkey”. In: Lim, Y., Niedderer, K., Redström, J., Stolterman, E. and Valtonen, A. (eds.). **Design's Big Debates - DRS International Conference 2014**. p. 16-19. Junho, Umeå, Suécia. Available at: https://dl.designresearchsociety.org/drs-conference-papers/drs2014/researchpapers/58. Access: June 10th, 2024.

WHITE, P. J.; DEVITT, Frank. “Creating personas from design ethnography and grounded theory”. **Journal of Usability Studies**. V. 16. N. 3. 2021. p. 156-178. Available at: https://dl.acm.org/doi/10.5555/3532758.3532760. Access: June 10th, 2024.

ZAMANI, Bahador; BABAEI, Ehsan. “A Critical Review of Grounded Theory Research in Urban Planning and Design”. **Planning Practive and Research**. N. 36. V. 1. Outubro de 2020. p. 77-90. Available at: https://doi.org/10.1080/02697459.2020.1830240. Access: June 10th, 2024.