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Now we know: Findings from a critical pedagogy experiment on the nature of codesign knowledge

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Abstract: When learning codesign, design students often find themselves in the anxious position of not knowing whether they know codesign. Codesign' emphasis on shared knowledge and facilitation stands in contrast to the individual knowledge and mastery cultivated by expert design, with which students are more familiar. Critical pedagogy, an emergent approach in design education that emphasizes developing critical consciousness of the contradictions behind design, is a promising candidate for learning the shared nature of codesign knowledge. To verify this possibility, this research conducted a critical pedagogy experiment with graduate design students in the United States supported by the Blind Side gamestorming technique. The evidence presented here consists of speech, gestures, and actions performed by the participants, captured on video, and analyzed through the interaction analysis method. The analysis of this evidence suggests that once students develop critical consciousness on the contradiction of knowledge co-creation, they become more confident to explore the unknown unknowns and create new knowledge.

***Keywords**: Codesign, design education, critical pedagogy, gamestorming, knowledge management.*

Introduction

Contemporary knowledge-intensive professional environments increasingly require designers to engage deeply with the knowledge that underpins their work (e.g. Friedman, 2001). This involves questioning what they already know and looking into what has been missed or forgotten in the organizations they work for. Organizations that compete in a knowledge economy—those that generate profit primarily from intellectual work rather than manufacturing or extractivist work (Powell, W. W. & Snellman, K. 2004)—strive to produce as much knowledge as possible. However, they cannot know everything. The so-called *blind side* phenomenon occurs when organizations focus too much on producing knowledge in one area while overlooking another (Gray et al., 2010). To mitigate this contradiction, organizations engage in knowledge co-creation, which in turn, adds the challenge of managing the production of something that does not yet exist and is never finalized (Engeström, 2001).

This knowledge management approach implicates designers in several ways. Instead of playing the role of experts for the lay people they design for, designers must recognize that every project stakeholder or participant they design with is an expert in something—particularly in their social circumstances, habits, behaviors, attitudes toward risk, values, and preferences (Steen, Manschot, & De Koning, 2011). Moreover, they need to create opportunities for multidisciplinary teams and diverse collectives to recognize each others' expertise. The primary task in co-creative design, or codesign for short, is to develop socio-material structures and processes that bring people together in meaningful roles (Zamenopoulos and Alexiou, 2018). Because they share their design culture (Manzini, 2015) through codesign, they sometimes claim to be co-creation enablers (Thomson and Koskinen 2012). For instance, they can provide 2D, 3D, or physical models that support others in discussing their ideas for the design in question (Dorta, Kinayoglu, and Boudhraâ 2016) and in transforming tacit knowledge into explicit knowledge (Sanders and Stappers 2008).

Design Education is increasingly aware of the need to prepare design students to deal with the inherent knowledge uncertainty of acting as a cocreation enabler (Light and Akama 2012; Minder and Heidemann Lassen 2018). Vandenhende (2013), for instance, describes how starting from what students already know provides the foundation from which their unknown can be explored. Similarly, Tracey and Hutchinson (2015) found that embracing the unknown in design education is not just about tolerating uncertainty but about seeing it as an integral part of the creative journey. As for codesign education, specifically, Örnekoğlu-Selçuk and colleagues (2023) noted that "codesign education should not be one-sided, which is given or presented to students by the instructors. Instead, students as active learners may initiate their co-design learning process."

Angelon and van Amstel (2021) offer a compelling example of how students who take the initiative to codesign their own learning process end up discovering unexpected aspects of codesign. In democratic design experiments described by them, design students discovered the issue of aesthetic injustice by co-creating and codesigning against the graphic design canon. Understanding their privileged positionality as designers and their underprivileged positionality as colonized, women, and workers were key to create knowledge in a critical way.

Considering the key role of positionality in knowledge co-creation, we will disclose ours in the next lines as an introduction to empirical work presented below. The first author is an Iranian woman and designer whose experiences are shaped by growing up in a politically charged environment, where expression is often constrained and identity is negotiated daily. The second author identifies herself as a mixed-race woman from Bolivia, where power, knowledge, and cultural dynamics are intertwined. The first and second authors are graduate teaching assistants in a graduate design program at the University of Florida, United States of America.

In 2024, they observed a critical pedagogy experiment conducted by the third author—a former faculty member and a Dutch-Brazilian man—that provided a graphic space for undergraduate students to learn how to learn and design how to design. Inspired by this experiment, they reproduced it with their peers in their allotted graduate seminar class, in that same year. In this kind of seminar, graduate students can hone their skills in reading scientific articles, developing research questions, and teaching design. In previous seminars, students had voiced concerns about their graduate experience being ambiguous at times, confusing even, and heavily theoretical. This program aims at developing codesign knowledge from community engagements (Dos Santos, W. B., Mazzarotto, M., & Van Amstel, F., 2023) and, as such, cannot avoid the inherent contradiction of knowledge co-creation: the more learners learn together, the more they confront uncertainties about the optimization of their learning process. We wanted them to realize this contradiction while learning how to deal with it in a productive way.

The students range in age from 21 to 35 years old and represent multiple racial backgrounds. The group includes six first-year and three second-year master's students. As most of the master's students are from the Global South—Africa, Asia, the Middle East, and South America—we choose critical pedagogy for its origins in Brazil, Peru, Chile, and Guinea-Bissau. The experiment was also an opportunity for the authors to question their teaching and learning experiences while delving into the theoretical background behind critical pedagogy and codesign. The authors were as much as puzzled as other students about the nature of codesign knowledge.

This aspect of codesign is challenging as it requires reflecting on what design knowledge is (epistemology) and how it can be co-created (methodology). Many times, organizations are so busy figuring out how to optimize their production processes end up compromising such reflection. While looking at healthcare facilities codesign, for example, Van Amstel (2015, p. 155) found out that

> "The optimisation of work processes clashes with the co-creation of knowledge because knowledge cannot be mass-produced like information. Knowledge requires going through long periods of sense-making and relating, processes that cannot be optimised due to their subjective and inter-subjective nature."

This research looks for traces of this contradiction in another realm: codesign education. Similar to healthcare collaboration, codesign demands not only technical skill but also epistemological awareness, an ability to engage with uncertainty, negotiate meaning, and recognize the social production of knowledge. That is the second reason why we have chosen this approach to investigate the nature of codesign knowledge: critical pedagogy cultivates self-awareness of how knowledge is socially produced while learning about a certain theme.

Theoretical background

According to Souza and Cunha Filho (2022, p.4), critical pedagogy is characterized by a "constructive resistance to what is currently taken for granted, whether this is seen as the ideological givens of texts or the assumed identities and dispositions of learners". Generally, critical pedagogy stands against the taken for granted of banking education, a mode of knowledge production in which knowledge is "deposited" into students' minds as if it were a valuable product to be accepted with gratitude, memorized, and saved for the future (Freire, 1970). Critical pedagogy stimulates learners to develop critical consciousness on the role of power and oppression in knowledge production, enabling students to learn about their world while transforming it.

As the research done by the Design & Oppression Network has shown (Serpa et al., 2022; Souza & Cunha Filho, 2022), critical pedagogy enables design students to actively participate in the co-creation of knowledge and recognize their agency as knowledge producers. More than that, its ultimate goal is not to learn something for its own sake but to learn what can foster solidarity bonds among the oppressed so they can change their reality. Critical (design) pedagogy directly addresses the historically oppressive boundaries between teachers and students so that "[..] these roles are contaminated, so that everyone involved has something to contribute, everyone teaches and learns, everyone designs and is designed" (Mazzarotto, 2022, p. 15). Critical design pedagogy is thus based on design experiments in which students alternate between the roles of teachers, designers, and users.

Methods and materials

In design research, design experiment is a generic name given to empirical research unveiling the nature of design processes and design knowledge (Redström, 2007). The same term is also used in educational research to define classroom interventions that control the learning process to measure its outcomes (Brown, 1992). Remarkably against control and oppression, critical pedagogy does not endorse such experimentation; nevertheless, some educators use the term "problematizing experiments" (Francisco Jr et al., 2008) to describe their process of developing critical consciousness in the classroom. In a similar vein, participatory action research, a broader research method inspired by critical pedagogy that includes any participant as a co-researcher, includes experimentation as a potential participatory technique (Fals Borda, 1991, p. 10).

Considering that, we speak of educational experiments in a similar way codesign speaks of democratic design experiments in the public: an unsettling mix between parliament and laboratory (Binder et al., 2015). Instead of controlling the learning process, such experiments promote the participation of learners in taking hold of their learning process. Drawing from these research streams, we define *critical pedagogy design experiment* as a participatory action research process of problematizing, naming, saying, and transforming the world not just with new words but also with new artifacts.

The critical pedagogy design experiment described here uses the Blind Side artifact to transform the world, a gamestorming technique proposed by Gray and colleagues (2010) to visualize neglected knowledge production areas in an organization. The Blindside game stems from the infamous political discourse of former US Secretary of Defense Donald Rumsfeld, criticized but also complemented by philosopher Slavoj Žižek. In a press conference in 2002, when asked by a journalist about the motives behind the impeding War on Iraq (2003-2011), Rumsfeld distinguished three kinds of knowledge: *known knowns*, *known unknowns*, and *unknown unknowns*. His words were:

> Reports that say that something hasn't happened are always interesting to me, because as we know, there are known knowns; there are things we know we know. We also know there are known unknowns; that is to say we know there are some things we do not know. But there are also unknown unknowns the ones we don't know we don't know. (*Department of Defense News Briefing - Secretary Rumsfeld and Gen. Myers*, 2002).

With those words, he bamboozled the journalist and justified the invasion of Iraq despite the lack of evidence of that nation's possession of chemical and biological weapons. Rumsfeld did not come up with this conceptualization alone, though. Apparently, he simplified the Johari window (Spennemann, 2023), a method developed in 1955 by two American psychologists, Joseph Luft and Harrington Ingham, who also developed the idea of *unknown unknowns*. After Reflecting on Rumsfeld's political statement, Slavoj Žižek (2006) developed the category of *unknown knowns*: things we know deep down but are not consciously aware of—like ideology. The Blind Side gamestorming technique integrates the three Rumsfeld categories and Zizek's additional category in a visual matrix of four quadrants: a) "we know that we know", b) "we know that we don't know", c) "we don't know that we know" and d) "we don't know that we don't know" (Figure 1).

Figure 1. Final look of the quadrants of the Blind Side game played with post-it notes and objects adhered to the classroom studio wall.

Zizek's new category is crucial for critical pedagogy, as this approach begins with students realizing they always bring "knowledge made from experience" to the class (Freire, 2018, p.166). Soon, students realize they know more than they think they know, each in their own way. Freire (2018, p. 72) once wrote in his fourth public letter to those who dare to teach: "No one knows it all; no one is ignorant of everything. We all know something; we are all ignorant of something." This understanding of knowledge is behind critical pedagogy's emphasis on learning through dialogue.

Instead of relying on teacher-to-student knowledge transfer, critical pedagogy relies on students-with-teachers knowledge co-creation.

To integrate critical pedagogy within the Blind Side activity in the graduate studio, the authors introduced the (Anti)-Dialogical cards developed by Mazzarotto and Serpa (2022) in the Design & Oppression Network. Each card contains a major concept developed by Paulo Freire in his *Pedagogy of the Oppressed* (1970)—a text which experiment participants were not familiar with. There are two kinds of cards in the (Anti)-Dialogical deck, described in the next paragraphs.

Anti-Dialogical cards: contain actions that are supportive of oppression. They express behaviours and attitudes in which design is applied as a weapon to force opinions and ideals upon others without honest discussion or consideration of the needs of those affected and their local context. These cards criticize top-down design processes where the designer or a dominant group sets the parameters, often silencing or marginalizing the voices of those to be most affected.

Dialogical cards: contain actions that encourage collaboration, reflection, and actions that align with overcoming oppression. They promote an understanding of design as a process that should be participatory, involving the people for whom the design is intended. These cards highlight methods and concepts that encourage dialogue, critical thinking, and mutual learning, contributing to a more equitable and emancipatory form of design.

Each dialogical card was crafted to oppose an anti-dialogical card, configuring a dialectical unity (see Table 1 in Mazzarotto and Serpa, 2022 and also Figure 2 here). We hypothesized that by using these cards, students could reflect and develop a more targeted and meaningful strategy that acknowledges and addresses the contradiction of codesign knowledge faced by all of them in the design program, leading to further critical consciousness of their reality. The cards were introduced after mapping everything they have learned or not learned in their program. Critical pedagogy, however, involves more than merely applying what you already know to what you don't. It also entails unveiling what cannot be entirely known: the contradictions that make up human reality. The (Anti)-Dialogical cards served then as mediators between knowns and unknowns but also as carriers of contradictions to be unveiled.

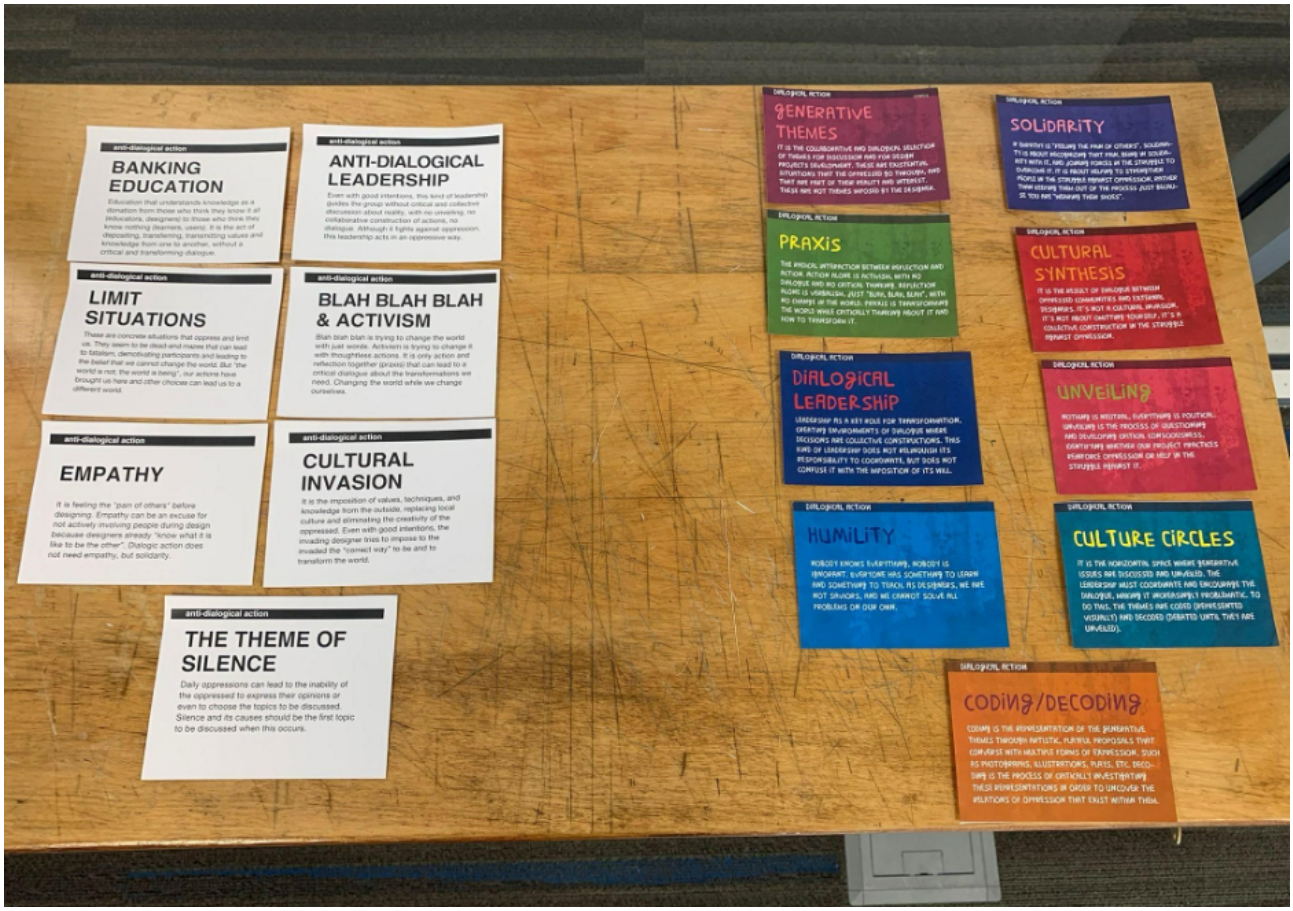

Figure 2. Anti-dialogical (left side) and dialogical cards (right side) used in the experiment.

Before the experiment, students were encouraged to read two selected readings on critical pedagogy: a journal article on student striking as a critical pedagogy approach (Souza & Filho,2022) and a book chapter on critically reading graphic design in advertisement pieces (Schmitz, 2023), which both draw from the seminal work of Paulo Freire (1970). The experiment started by inviting the students to reflect upon the assigned readings within the context of the seminar's sequence, a discussion that lasted for 30 minutes. After that, we spent one hour filling out the Blind Side Game and another hour and a half discussing the (Anti)-Dialogical Cards. The authors kept the studio set up so students could discuss the readings around the table area and afterward stand up together to participate in the activities next to the window display where the Blind Side game was played. The students were given sticky notes to write down what collectively they knew and didn't know about the design program. These sticky notes were placed in the Rumsfeld/Zizek matrix as they were written down.

To make our research bias more visible in subsequent analyses, we decided to record the experiment on audio and video instead of relying solely on participant observation. We analyzed this qualitative dataset using Jordan and Henderson's (1995) interaction analysis, a method that highlights the role of the human body and surrounding artifacts in dialogue. We chose this method due to critical pedagogy's emphasis on dialogue (Freire, 1970) and codesign emphasis on artifact manipulation (Binder et al., 2015; Sanders and Stappers, 2008). Watching and listening to the recordings multiple times, both alone and together, allowed us to notice details that we missed during the live sessions, particularly, in non-verbal interactions and their expression of tacit knowledge. Organizing these transcripts into tables and spreadsheets helped us to compare different parts of the data and find recurring patterns. We looked through the transcripts separately and then discussed them together to find themes related to the study's focus on critical pedagogy. Finally, we made sure our analysis stayed focused on the contradiction of knowledge co-creation.

Experiment results

Most students were reading about critical pedagogy for the first time. As one might imagine, most (anti)dialogical cards were placed in the unknown quadrants, although some were left in the known quadrants. This happened because critical pedagogy creates opportunities for learners to reflect on what they already know, without discrediting or disregarding their "knowledge made from experience" (Freire, 2018, p. 166). The gamestorming technique was challenging for us, too, as we were also often confused about what knowledge should go in each quadrant. The facilitator's role in critical pedagogy, also known as *complicator* for its provocative stance (Serpa et al., 2022), was particularly difficult to wrap our heads around. Sometimes we facilitated, other times we complicated the discussion on where each card should go (Figure 3). Moreover, it was humbling to realize that none of the authors mastered the surveyed codesign knowledge, especially in the area of not knowing what we don't know. Every time someone positioned knowledge under this category, it looked like an "aha" moment for all of us. It is noteworthy to mention that their professor, the third author, acted as complicator only when dialogue was stuck.

Figure 3. Four students are questioning each other to decide in which quadrant to position a particular codesign knowledge.

Design students were able to fill out more sticky notes in *what they know they know* and what they *know they don't know*, compared to what they *don't know they know* as well as what they *don't know they don't know* (Figure 4). That means students were more aware of what they knew than what they didn't know. In any case, sticky notes eventually moved from one quadrant to the other following the discussion. Hardly anyone was certain on where each sticky note should be placed, yet students respected each other's statements. They challenged each other's thinking but not to the degree of forcing each other to comply with something. Students kept a constructive tension in their dialogue, as expected from a critical pedagogy experiment.

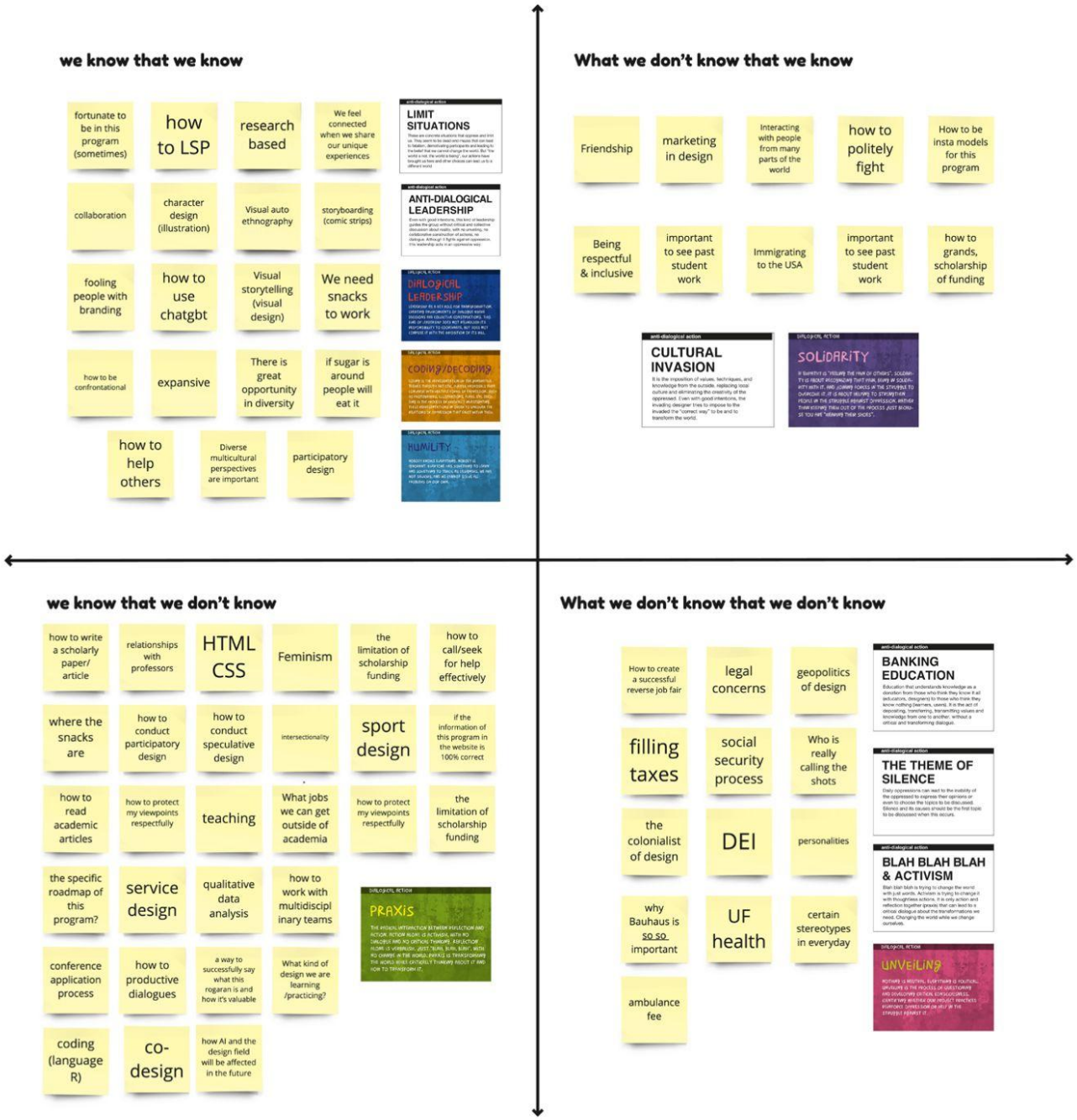

Figure 4. Reconstruction of the Blind Side game played in the critical pedagogy experiment.

Once the dialogue between students toned down and the time set for the Blind Side was over, we moved to classify the (Anti)-Dialogical cards in the same matrix. Since they haven't read *Pedagogy of the Oppressed* (1970) where the concepts came from, students were unsure what the cards stood for and were a bit dubious where to place them in the matrix. We encouraged them to read the cards aloud so that they could all discuss what memories or ideas the concepts evoked when they heard their descriptions (Figure 5). We hypothesized they knew some of the issues described by Freire (1970) even if not explicitly—i.e. as tacit knowledge.

Figure 5. Four students listen attentively to the reading of a card.

If they didn't know a concept included on a card, they could choose between relating the concept to somethings they knew beforehand they didn't know or something now they realized they didn't even know that existed—an *unknown unknown*. For instance, student A put The Theme of Silence (Figure 6) under the *we don't know that we don't know* quadrant. For her, someone might want to say something in a discussion but might not feel sure or comfortable sharing their thoughts. Student A recalled an earlier class in which she presented her work and compared it to her peers: "I wasn't exposed to that kind of design [peer work]. I was nervous, but as we got through it, it got better and more like... I would not say" (Student A, transcription fragment).

Figure 6. student A reflecting on the The Theme of Silence card while the other student listens to her.

After seeing the first author's work, she felt hopeless about achieving that same level of graphic design skill, but she did not say anything then. This reflects a common barrier in co-design where participants feel unsure or lack the confidence to contribute to knowledge co-creation. Because of this barrier, codesign requires creating an environment where all participants feel they can contribute, an non trivial task (Sanders and Stappers, 2008). A little later in the dialogue, the third author took the opportunity to bring the discussion back to codesign knowledge and its peculiar way of preventing the Theme of Silence:

> How do you prevent this? I mean, a co-design tip is you never give a very precise material for designing. If you don't want someone like [first author] to show off, and it... I mean, you give her a very thick pen, and everyone has the same thick pen, she cannot display her special skills. So, you equalize people through the medium that you're choosing for (Faculty member, transcription fragment).

In this experiment, codesign equalization was attained by relying on sticky notes, thick pens, and the (Anti)-Dialogical cards. We leveled the playing field (Sanders and Stappers, 2008) so that all players could have an equal opportunity to participate despite eventual disparities in design skills. This codesign practice matches critical pedagogy's aim to create culture circles where students feel equal and confident to speak up and learn from each other (Freire, 1970). The Theme of Silence is a sign that students are uncomfortable with saying their word, a typical situation in banking education, which is the opposite of critical pedagogy.

Reflecting on this opposition, student B positioned the Banking Education card in the "we don't know that we don't know." Later in the conversation, this same student picked the Dialogical Leadership card and put it next to Banking Education. For Student B, students have as many stories to tell as history teachers. Student B then moved the Dialogical Leadership card away from the unknown unknowns where Banking Education was positioned. His hesitant comment and action reflected the fear of challenging the teacher's authority:

> I'm putting it here because I feel that critical and transforming dialogue is important to have within… uhm… the education. It seems very one-sided saying that we're all learning from educators and that educators are learning from us. It seems that's a mutual transaction, not supposed to be this thing so one-sided. I don't know if it's related or not, but it kind of reminds me of like we read from past history about passes, instead of somebody who actually experienced them telling the story. History is nobody; they didn't experience it; they're just telling a story of what they think happened. (Student A, transcription fragment)

Students then moved on to reflect on the authority of designers in knowledge production. Similar to teachers, designers don't know everything and, thus, must rely on dialogue in knowledge co-creation. Sanders and Stappers (2008) indeed assert that co-design challenges traditional hierarchies of expert-driven design by engaging participants in dialogical processes where learning occurs in both directions. Student B's reflection on the "mutual transaction" reflects this shift from passive to active learning, i.e. a reciprocal engagement. Student C moved the discussion further with the Humility card, bringing the limitation of the designer's role in codesign to the fore:

> It's a no. We cannot solve problems. Let me use health as an example. Some people have all the money, they can afford all the health, like the doctors, the surgeons, but money can't solve the issue. They have the money, they can pay for it, but they still suffer with the sicknesses, or the problem. You get my point? Because... some designers can buy, pay for the Adobe stuff, get every new computer, but come on, put them behind Photoshop. And what they know how to do is just a little, you know, because as it said, you don't know everything (Student C, transcription fragment).

The student who posed the Humility card is adamant that we designers will never know everything, even if we have help from others or the best infrastructure to solve the problems at hand. This was the first time students visibly noticed a broader contradiction of knowledge production: learning does not only produce knowledge but also some form of ignorance as we discover things we didn't know (Engeström, 2010). As an impromptu provocation, the third author (a teacher) said, "there is always something we don't know...", to which the second author (a student) replied: "... and there is always something we know". This provocation is similar to what Sanders and Stappers (2008) write about codesign knowledge: even experienced designers must acknowledge that they do not know everything. Nevertheless, the provocation brought together the other side of the contradiction: that designers always know something and, as such, are accountable for it.

At the end of the seminar, the authors provided a space for students to share how they felt after the activities about design education and their role as design students and educators. Some students shared their thoughts on the benefit of having a flexible yet guided framework that encouraged students to explore and grow their ideas autonomously within a supportive context. For example, Student A appreciated the structure provided:

> I would just say I really enjoyed how this made me think and really figure out what do I know, what don't I really know… I think you did a pretty good job in facilitating it and letting us be free with how we do it one I also like that you gave like some type of guideline or like instruction kind of just so we're not like going up there and just doing whatever. Giving us just some type of baseline, and then we just do as we please on the board. So, I like the structure of a slight instruction or just a gist of... Like a seed. Yeah, like plowing a seed and then putting us by the window to let us sprout... It was in a good way. I feel like I know a lot more now (Student A, transcription fragment).

This student is trying to make sense of the relationship between seminar organizers and the participants. Student A builds up on a seeding metaphor introduced by the third author at an earlier moment in the dialogue. Even if the Rumsfeld/Zizek matrix raised awareness of our ignorance, it also made us feel that we knew more about our ignorance, hence the student contradictorily acknowledged she was more knowledgeable after the experiment. Student A's metaphor about planting seeds also reflects the iterative and evolving nature of knowledge co-creation. As in Hagen's and MacFarlane (2008) framework, seeding involves initiating participation, building momentum, and fostering a sense of ownership within a community. The metaphorical action of "put [the seed] by the window to sprout" seems perfect to convey the role of the facilitator in codesign: providing a structure (or the initial seed) for participants to take ownership of their design process. Student A noticed the challenge of providing just enough instruction to initiate thinking and exploration, allowing participants to "sprout" their ideas in a structured yet flexible framework.

In general, students valued the tangible aspect as it compensated for the vagueness of the content—codesign knowledge. They compared the sensuous qualities of this seeding structure to digital whiteboards adopted in previous classes. Students learned by doing that the tangible nature of co-design tools fosters collective creativity by making

abstract concepts visible and actionable, in tune with the related literature (Sander and Stappers, 2008). The seeding structure was fundamental to realizing their shared knowledge, as another student remarked:

> It is cool just seeing those all posted up in physical form. Because we are all bringing different things that we have not thought about before that we do not know (Student B, transcription fragment).

Other students also considered the cards' underlying meanings, which are about the challenge of doing critical pedagogy and the variety of ways of fostering a collective learning activity. These challenges, conveyed through the pair structure (dialogical vs anti-dialogical cards), appeared as a sort of a riddle to Student E:

> I think I enjoyed the fact that this section of [using] the [(Anti)-Dialogical] cards was more hidden. So, it gives you the pressure of thinking in the moment and trying to align your thoughts and express how you feel to other people while you make specific choices, like with the placement of these things [in the matrix] (Student E, transcription fragment).

Student E's reflection captures the idea that codesign pushes individuals to challenge their perspectives through continuous reflection, similar to how Sanders and Stappers' (2008) conceptualized codesign participatory processes to uncover hidden insights, as participants are challenged to think beyond their initial assumptions while expressing (and sometimes discovering) their tacit knowledge.

Discussion

This study probed into the nature of codesign knowledge by running a *critical pedagogy design experiment* with design students. The experiment revealed that codesign knowledge is always partially known and unknown, never to be fully absorbed or exhausted. By critically reappropriating the Rumsfeld/Zizek matrix, an oppressor's tool, design students moved from what they knew to what they didn't know about codesign. . By acknowledging and engaging with the underlying contradictions of the Rumsfeld/Zizek matrix and the (Anti)-Dialogical cards, design students developed a more nuanced understanding of what is at stake in knowledge co-creation.

Based on this experiment, we can suggest that the Rumsfeld/Zizek matrix operationalized by the Blind Side gamestorming technique—and potentially other oppressor's tools—may contribute to pluriversal approaches to design education (Noel et al., 2023), provided self-knowledge is shared and constructed collaboratively rather than imposed hierarchically. This experiment adds up to the growing movement to rethink design education away from traditional, oppressive practices, and towards participatory forms of learning and critical consciousness (Dos Santos et al., 2023; Mazzarotto & Serpa,2022; Souza & Cunha Filho, 2022; Serpa et al., 2022; van Amstel, F., 2021).

The first and second authors initially thought the experience would require more hands-on involvement from facilitators. But other students soon began leading the class while holding the codesign materials we shared with them, leaving us in the role of complicators—mediators who complicate dialogue (Serpa et al., 2022). In that role, it humbled us to realize how important it is to listen to our learning partners and to provide a space for them to question their current struggles and how they envision the type of education they want to attain and provide. Similarly, it was challenging to navigate the students' internal struggles and make sense of what we experienced as we went through our qualitative data because, in a way, like the (Anti)-Dialogical cards creators, the design educators Marco Mazzarotto and Bibiana Serpa (2022), we were also trying to make sense of our education experiences through them.

Looking critically at our positions as complicators, we wondered what would have happened if perhaps we tried to play the Blind Side game on their own before the seminar. As complicators, we did not know the answer to some of the students' questions, and we vocalized this to be transparent with them. This made us reflect on the idea that perhaps more reading should have been done on our part on what lies behind the Rumsfeld/Zizek matrix activity before hosting the experiment. For example, at that time, we did not know about Slavoj Zizek's addition to the matrix, widely misattributed to Donald Rumsfeld. This would have helped in exploring further the contradictions that arose in the experiment.

Above all, we reflected, with Souza and Filho (2022) that: "regular design education activities as 'working for others' ('for being graded')" stand in contrast to "learning for themselves as a genuine support to each other in their education journey". We produced codesign knowledge for the sake of our critical consciousness, not just to mitigate the Blind Side of the organization we were located in—the university, an institution that is often criticized for perpetuating banking education and knowledge fragmentation.

Despite its limitations, this investigation presents evidence how students from various backgrounds learn codesign by codesigning something (in this case a representation of their shared knowledge/ignorance), a subject often overlooked in design education (Örnekoğlu-Selçuk et al., 2023). We found that the gamestorming technique challenged and, at the same time, enabled students with diverse viewpoints and cultural backgrounds to co-create knowledge. From that, we can conclude that critical pedagogy, instrumentalized by gamestorming and other codesign tools, can contribute to educating designers who are not just technically adept but also critically engaged, capable of creating opportunities for the emergence of diverse design practices and cultures.

The experiment shows that codesign knowledge is transformational by nature and changes continuously as new contradictions manifest in the design space. In hindsight, we realized that challenging what we know brings about tension and conflict, but when done in a dialogical way, new processes of knowledge production can emerge. This experience highlights, thus, the potential for participatory approaches to transform design education by moving it away from hierarchical, product-driven models and toward relational, political, and culturally grounded forms of learning that embrace multiplicity and critical consciousness.

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