The Value of Design Education for Other Fields: Using Design Tools to Teach Psychology

Mafalda Casais

Abstract This paper proposes the use of design tools and studio environment in psychology teaching, based on a type of outcome that is already produced in this field—interventions to support people's well-being. In a class with 24 students from a post-graduation study in positive psychology, we introduced a sequence of six canvases (persona, empathy canvas, journey mapping, design vision, well-being matrix, and a blank canvas to draw the intervention) and distributed students in multi-disciplinary groups. Introducing a studio format with design tools aimed to offer a different perspective on thinking about potential patients/clients/users and contexts through an action-based, opportunity-driven setup. Results show an impactful effect, a successful production of interventions to apply in practice, and overall high levels of engagement and satisfaction. While this paper reports a single case, it proposes that this approach is worth exploring further. Its contribution is twofold: considering process and content, it introduces human-centered design thinking to an educational context that already sought it tacitly; considering format, it empowers psychology students to think like designers and approach the educational experience in a more horizontal perspective of knowledge transfer. We discuss how design tools and educational modalities might be appropriate to introduce into the education of other disciplines, still considering their specific needs and aims—like a *globalized* approach to education, which we call *Education through Design.* Also, we discuss it in the context of the future of education, from a convergency tendency perspective at a European level.

Keywords Design studio pedagogy · Globalized education · Design tools and methods · Human-centered design thinking

M. Casais (✉)
CIAUD, Lisbon School of Architecture, Universidade de Lisboa, 1349-063 Lisboa, Portugal
e-mail: mafaldacasais.ciaud@fa.ulisboa.pt

1 Introduction

Designing for the future of education requires design education. [1]

Pedagogical instruments originating from design—i.e., design methodologies, the studio classroom format, design tools—are of great value for the education of design disciplines (communication design, product design, engineering, architecture, etc.).

Among the reasons for this are the fact that designers think visually [2–4], and that design is learned in the process of designing [5].

Introducing design tools (instruments that help in *doing* something), together with design methods (recipes for knowing *how* to do something), is potentially interesting in the educational context of fields outside of design. The reason for this is that often the goal of other domains of knowledge and practice is also to create interventions for a specific target audience. These *designerly ways* of teaching that originate from the design field can bring in depth understanding of people and contexts, and help in the development of situated interventions for specific aims, which is a goal of fields like psychology.

In this paper, we report a case in which design tools conveying design methods were used in a psychology class. Specifically, we introduced a set of canvases with different methods to understand people and their contexts, and to help create something for their well-being. In addition, and inherent to the use of these tools in groups, a studio environment was set up in the classroom. This allowed diverse teams to form and to explore the material progressively, in close connection with the teacher. The response to the introduction of this didactic material was evaluated from the point of view of the students, through a questionnaire.

Specifically, we present a study with 24 students from a post-graduate course in applied positive psychology, describe the *designerly* materials that were introduced, and discuss the questionnaire results. Also, we discuss the resulting insights in the context of the future of education, from a convergency tendency perspective, as observed by the streamlining of higher education at a European level—with formats such as ECTS credits or the Bologna cycles, proposing an *Education through Design* approach.

1.1 *Teaching Positive Psychology Using Positive Design Thinking*

Positive psychology is a branch of the field of psychology that studies human well-being, develops theoretical models to explain it, and devises and tests strategies to improve it. Its founding scholars define it as

a science of positive subjective experience, positive individual traits, and positive institutions [that] promises to improve quality of life and prevent the pathologies that arise when life is barren and meaningless. [6, p. 279]

Among the different types of research conducted in this branch, Positive Psychology Interventions (PPIs) are a widespread outcome. PPIs are scientific tools and strategies focusing on supporting well-being and positive cognitions and emotions [7]. Examples of PPIs are protocols and guidelines for therapy and coaching, workshops for self-knowledge, meditation, gratitude, or for better communication, etc. This can be seen as a form of design, in the sense that there is an effort to develop something to bring a situation from A to B.

Positive design, is a field of design that does just that, using research on well-being to inform its methodologies and aims [8]. Specifically, it intends to design for opportunities—rather than for problems—and to purposefully support people's well-being, focusing on embodying some of these proposals (e.g., gratitude, self-knowledge) in concrete interventions (products, digital environments, games, spaces, interactions, etc.).

The example described in this paper, which used positive design frameworks and tools to develop PPIs, is a particularly interesting case because it shows how these fields closely intersect and can be mutually supportive. Currently we observe psychology informing design, but not the other way around—which justifies the approach we present in this paper, as an exercise to illustrate the assumed benefits of design thinking for psychology (and potentially other fields).

1.2 Teaching with Design Mechanisms

Human-centered design is a methodological approach originating from the design field. It focuses on human perspectives throughout the design process, including psychological and emotional factors [8]. This approach, applied to human-focused fields like psychology, can potentially help practitioners gain a more granular understanding of people and their contexts. In fact, in psychology, some design methodologies are already tacitly used. For example, in positive psychology (a branch of psychology that focuses on the study of well-being, devising and testing interventions to improve it, as described above), this is possible to observe. In master and doctoral theses from this branch, we can trace similar methodologies than those used in design [e.g., 9]. For example, the problem-based approach, an approach that uses "problems as the stimulus and focus for (...) activity" [10, p. 2]. This approach has also been used in design, and overlaps in many aspects with a project-based approach and design thinking [11].

Qualitative design methods [12, 13] such as the VIP (Vision in Product Design [14])—which encourages an examination of what the designer wants people to experience, or *Contextmapping* [15]—which encourages people (users) to manifest their understanding of their own context, present interesting possibilities for other fields. They can be used for team collaboration, co-creation, stakeholder involvement, and assessment of interventions in their context, which are research activities we find widely reported in the research output of positive psychology [16].

Another mechanism from design pedagogy that can be interesting for other disciplines is the studio format. "The design studio is (...) an educational setting where students fundamentally learn by practicing under the supervision of a teacher" [5, p. 22]. It deals with ill-defined problems and relies on a close exchange with the teacher, building on horizontal and reciprocal knowledge transfer, as opposed to a classical top-down teacher-student model. A design studio approach can bring these interactions (between students, and between students and teacher) to a next level of sharing and working together. Combined with a human-centered approach—the nuanced and empathic understanding of people and human perspectives around problems, the studio setting presents a promising educational setup.

We propose, therefore, that making these mechanisms explicit in an educational setting outside of design allows us to grasp their real value for the field. Using design tools is also a possible strategy to improve other educational settings.

Design tools are instruments that assist in the design process. They can be defined as compact formats (cards, booklets, canvases, digital guides, etc.) with data in the form of text and image, often with game elements. In addition, used in the design process these can be inspirational, informational, methodological, or a combination. They can provide systemic strategic support for a project or specific aid for part of it, as "powerful resources [that] intrinsically seem to reinforce [designers'] capabilities and capacities" [17, p. 607]. A well-known example of a design tool with a card set format is IDEO's Method Cards [18].

For this study, the design tools that were developed and distributed were six canvases to use in a class exercise. They were based on previously developed design methods, and adapted for the class context (see the Materials section for a description). Twenty-four students participated in an Applied Positive Psychology class, integrated in an executive master study in Applied Positive Psychology. The class was part of a module comprising of a theoretical class and a practical one, focusing on positive psychology interventions (i.e., interventions to improve people's well-being). The practical class was setup as an eight-hour workshop, with a one-hour lunch break (4+1+4 h). This allowed for an intensive studio session, going through the whole design process in a condensed period. The class was divided into four parts:

1. a slide presentation with an introduction to the topic and a description of the exercises;
2. the exploration of a user or group for whom to create an intervention;
3. the exploration of a situation for which to design; and
4. the sketching and detailing of an intervention to improve well-being.

1.3 Materials

In this section, we describe in detail the materials used in the class, and explain the design methods these were based on, as well as the aim of using these particular methods.
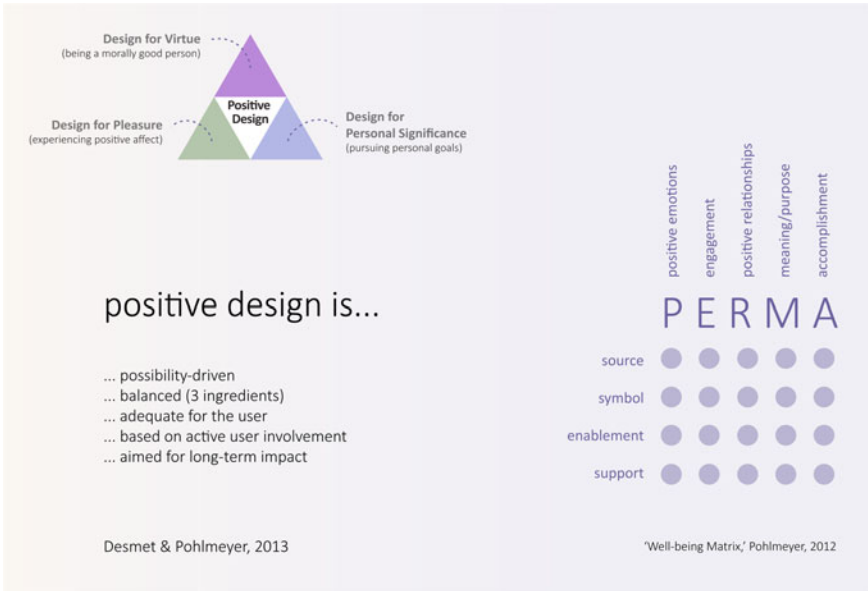
Fig. 1 Presentation slide about the positive design framework, the positive design ingredients (*Source* [8]) and the Well-being Matrix (*Source* [19])

Introduction Presentation. The class began with an introduction about positive design, based on the work of Desmet and Pohlmeyer [8]. In it we presented the Positive Design Framework, the ingredients of positive design, and the Well-being Matrix [19], as a basis from which students could work (Fig. 1). The latter provides a matrix of possible combinations between types of embodiment and well-being determinants, to generate ideas for interventions.

In the presentation, we went through the canvases one by one, explaining how to apply them to existing projects, to create new ideas, or to use the students' own person/context to go through the whole process and understand it from the user research until the intervention stage.

Design Canvases. Six canvases with design methods were developed to introduce in the class exercise: the first two canvases focused on the user, the third focused on mapping the situation/context to identify intervention opportunities, the fourth focused on the exploration of an effect for the intervention, followed by the exploration of possible intervention formats, and the last focused on the intervention detailing. The canvases were based on well-established design methods such as the *persona* method [20] or the Well-being Matrix [19].

Canvas 1: Persona. The first part of the workshop focused on understanding the user. For this, students were asked to either consider a familiar group, to imagine a group they would like to work with, or to consider themselves as a user, in order to go through the steps and understand the procedure.

The first canvas was entitled "Canvas about the Person (*Persona*)," and was based on the well-established *persona* method [20], originating from the marketing and consumer research fields.

> The personas approach proposes focusing on specific or canonical users. The principle is therefore to design a product adapted to different types of people, usually about a few dozen, representing typical consumers. From this viewpoint, the notion of a persona draws on its etymology: The actor's mask, each character playing a particular role during the performance of the play. [*ibidem*, p. 39]

The canvas comprised of six spaces to fill information about the potential user of the intervention (Fig. 2). Specifically, in the first space it asked the identification of the user (name, age, physical appearance, limitations, and talents). In the next space it asked how the person is, providing six sliders with two contrasting personality traits in each (extrovert-introvert, rational-intuitive, cautious-adventurous, imaginative-conventional, skeptical-naïve, and a blank pair to fill in). The next space was entitled "tasks" and asked questions about the person's profession and what they do in their spare time.

On the bottom row, the first left most space, asked about the person's context. Specifically, it posed five questions: where the person lives; where they come from; what their family looks like; the school level they achieved; and the groups they are a part of. The middle space asked about capabilities, namely the level of technology the person uses and the devices with which they interact. The final space, at the
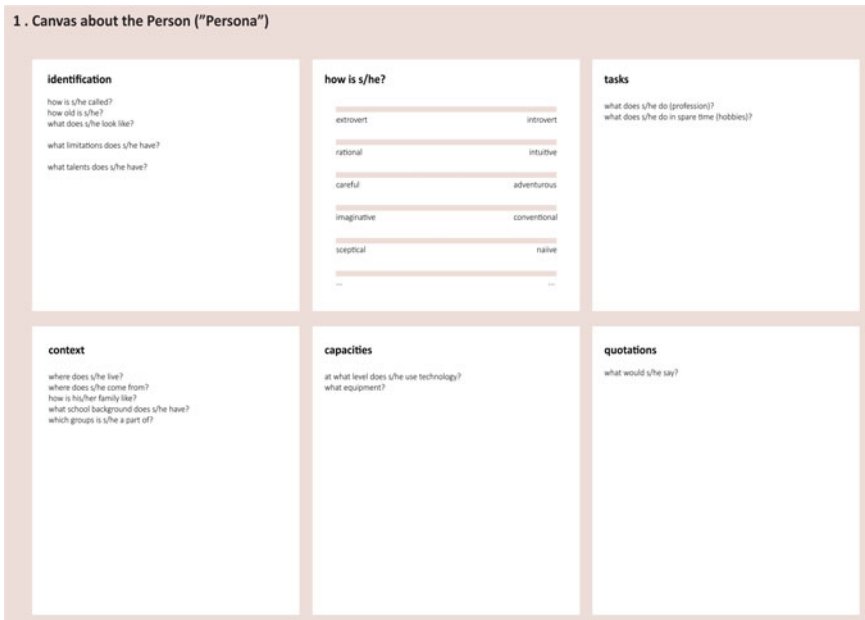

Fig. 2 Canvas 1 focused on general information about the target group/person (original printed size was A3)

bottom right side, asked for quotations of the person (these could be imagined even if the student was focusing on a real target group or person).

Canvas 2: Empathizing with the user. The second canvas, called "Empathy Canvas," also focused on understanding the user, however in a more profound way, based on the method of *empathy mapping* [21, 22].

> An empathy map is a simple, easy-to-digest visual that captures knowledge about a user's behaviors and attitudes. (…). The mapping process can help synthesize research observations and reveal deeper insights about a user's needs. (…) It can help guide the construction of personas or serve as a bridge between personas and concept deliverables. [21, para 5–7]

This canvas aimed to go deeper into the user's reality, their experiences, and their perception of the world around them (Fig. 3). It was organized in five spaces, radiating from a central space in the shape of a human head. The first space, at the top left side, began with the question: "WHO are we empathizing with?" (intentional emphasis on *who*). This was followed by three more specific questions, namely about who the person we want to understand is; what situation they are in; and what their role is in that situation.

Going in a clockwise motion, the second space begins with the question: "What does that person need to DO?" (intentional emphasis on *do*). Four additional specific questions followed, about what they need to do differently; the tasks they want or need to accomplish; the decisions they need to make; and the way they know they have succeeded.
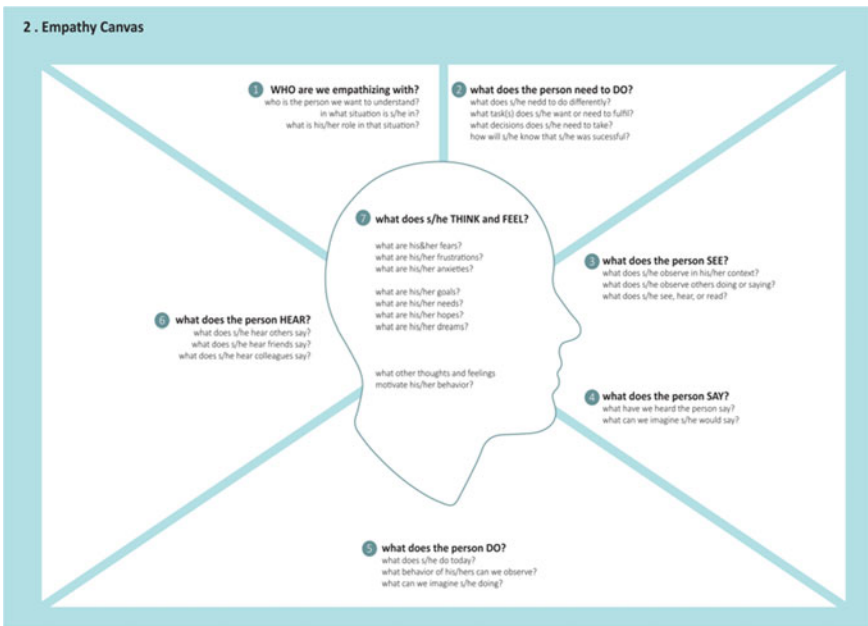

Fig. 3 Canvas 2 focused on specific information about the target and their context (original printed size was A3)

On the right most side of the canvas, we find a wider space with two heading questions and some follow up questions for each. The first question was: "What does the person SEE?" (intentional emphasis on *see*). This was followed by sub-questions about what the person observes in their context; what they observe others doing or saying; and what they see, hear, or read. The second question was: "What does the person SAY?" (intentional emphasis on *say*). This was followed by sub-questions about what we (designer/student) have heard the person say; and what we can imagine they would say.

Canvas 3: Mapping the journey. The third canvas, called "Journey Canvas," used the journey mapping method to "visualiz[e] the process that a person goes through in order to accomplish a goal" [23, para 1].

> (…) journey maps (also known as "experience maps" or "customer experience maps") (…) add a third dimension to traditional personas by focusing on a diachronic outline of a user's experience (…) over time. As the name suggests, journey maps provide a graphic visualization or a map of a customer's or user's experience (…). [24, pp. 10–11]

The canvas was divided into four parts (Fig. 4). On top, it asked for a description of the current scenario a person is going through, as well as for a description of the goals and ambitions for the person/situation. The middle section, the largest space, was destined for the journey visualization, in which students were asked to schematize the path and highlight the most important moments or key steps. Bellow, a smaller

Fig. 4 Canvas 3 focused on a journey or situation the target user goes through to identify opportunities for intervention (original printed size was A3)
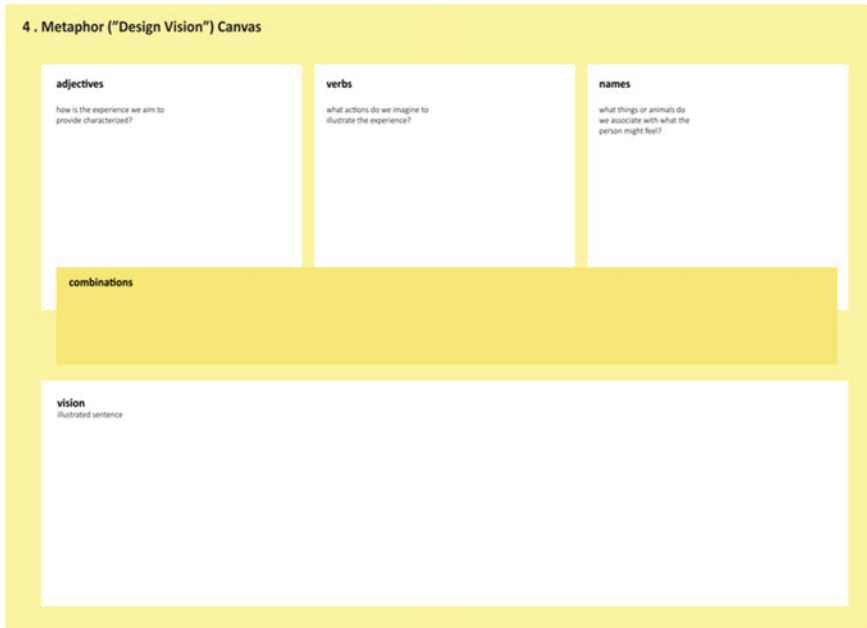
Fig. 5 Canvas 4 focused on envisioning an effect for the intervention through a metaphor (original printed size was A3)

space asked for the actions and feelings/emotions that were experienced in each of those moments. And finally, the last space in the bottom of the canvas asked students to identify opportunities they found throughout the ups and downs of the journey.

Canvas 4: Creating a design vision. The fourth canvas, called "Metaphor ('Design Vision,') Canvas" focused on the effect of the intervention (Fig. 5). It was loosely based on the Design Vision approach used at the Industrial Design Engineering Faculty of the Delft University of Technology [14, 25]: "A vision in the context of product design provides us with a personal, inspiring image of a new future situation created by a designer or a group of designers and/or other professionals [25, para 1]."

However, we aimed to used it more in the metaphorical sense, that is, to find an image that could illustrate an effect or a feeling, for the intervention. Metaphors build associations between different concepts, using the attributes of one to understand or represent the other [26]. Examples of this can be feeling as light as a feather as a result of using the intervention, or feeling as happy as a dog getting a treat, or even feeling like part of something bigger such as how a football cheering squad feels at the moment their team scores.

Canvas 5: Identifying design opportunities. The fifth canvas, called "Opportunity Matrix Canvas" used the Well-Being Matrix, proposed by Anna Pohlmeyer [19] to focus on finding opportunities for the intervention. The matrix crosses the PERMA model—the determinants of well-being as defined by Martin Seligman [27]: positive
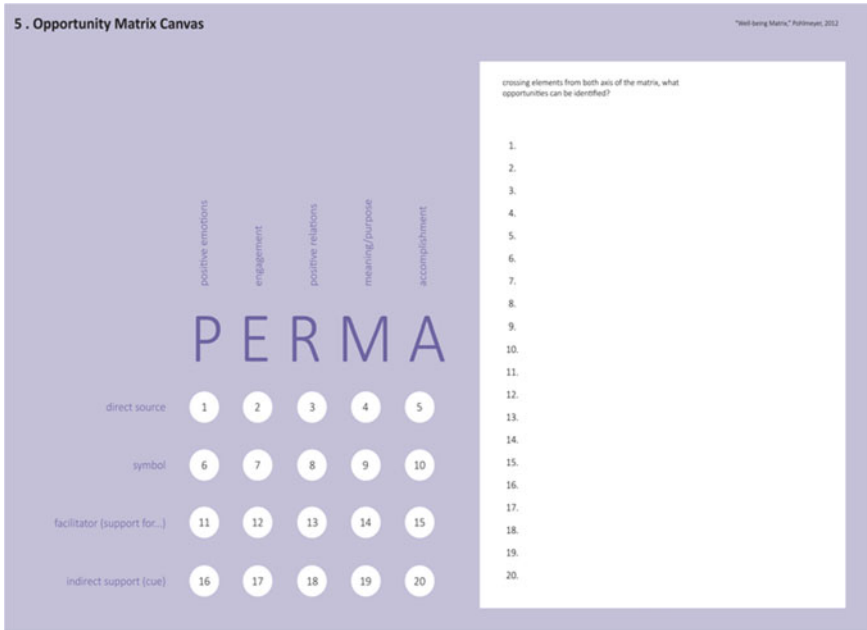
Fig. 6 Canvas 5 focused on identifying possible formats for the intervention (original printed size was A3; *Source* [19])

emotions, engagement, positive relations, meaning, and achievement—with possible embodiment categories—direct source, symbol, facilitator, indirect support.

The canvas is composed of the Well-being Matrix on the left side, and a list of the possible combinations on the right side (Fig. 6).

Canvas 6: The idea. The sixth and final canvas, called "Intervention Canvas" was the simplest out of all six, containing only one large space, which asked for a sketch of the intervention and its interactions, step-by-step (Fig. 7). During the class introduction, students were encouraged to use drawings, non-linear text, and diagrams as much as possible over linear text to explain their solution.

2 Method

To assess the appropriateness and usefulness of design tools in psychology education, a questionnaire was given to students to fill in a few days after the class. The questionnaire was send via social networking sites (*WhatsApp* mobile and desktop application) and via e-mail.

6 . Intervention Canvas

sketch of the intervention and its interactions
step-by-step description

Fig. 7 Canvas 6 focused on detailing the intervention through drawings or diagrams (original printed size was A3)

2.1 Questionnaire

The questionnaire included four open-ended questions about the limitations students faced in the class and the results they obtained; three yes/no questions about whether they found the class material appropriate for the given educational context; and several Likert scale-based questions (ranging from 1 to 5) to address the usefulness, clarity and potential of the canvases.

The questionnaire began with an informed consent stating: "The collected data aims to improve class materials and to inform the study of the use of design tools in psychology education. Any collected data is anonymous."

The specific questions were:

- I accept information gathering: Yes/No
- Demographic data: age, occupation
- Do you believe you understood the content of the class? Yes/No
- What limitations did you encounter in understanding the content of the class?

  – Options: material, slides, teacher, language, other

- Specify other issues you encountered.
- Did you learn new content about psychology? Yes/No

- Rate the class materials (canvases and presentation) using a scale from 1 (not at all) to 5 (excellent) on each separate element:

  - in general; on clarity; on usefulness; on potential

- Rate each canvas using a scale from 1 (not at all) to 5 (excellent) on each separate element:

  - Canvas 1—persona canvas: on clarity; on usefulness; on potential
  - Canvas 2—empathy canvas: on clarity; on usefulness; on potential
  - Canvas 3—journey canvas: on clarity; on usefulness; on potential
  - Canvas 4—metaphor/vision canvas: on clarity; on usefulness; on potential
  - Canvas 5—opportunity matrix canvas: on clarity; on usefulness; on potential
  - Canvas 6—intervention canvas: on clarity; on usefulness; on potential

- What impact did these tools have in understanding the process of designing interventions?
- What impact do you envision for using these tools in your professional practice?
- Do you consider design tools to be adequate for psychology education? Yes/No.

3 Results

From a sample of 24 students, 70% responded to the online questionnaire, a few days following the class. All participants were female, with an average age of 41 (ranging between 24 and 59). Nearly half (47%) were psychologists or coaches.

All students (100%) reported having learned new content, and nearly all (94%) having understood the class content. Language and presentation (29%) and program organization (not related to content = 35%) were mentioned as the hindering factors to content comprehension.

Regarding the appropriateness of using design-based tools in psychology education, all students (100%) responded positively.

Students considered the provided material (presentation + canvases) to be clear or very clear (4 or 5 out of 5 = 83%), to be useful of very useful (4 or 5 out of 5 = 89%), and to have a high or very high potential (5 or 4 out of 5 = 89%), as seen in Table 1.

Table 1 Assessment of provided material (presentation + canvases) on a Likert scale (1–5) in percentages

	1-Not at all	2-Not so much (%)	3-Could be better (%)	4-Good (%)	5-Very good (%)	Average (points)
Clarity	–	6	11	33	50	4.2
Usefulness	–	–	11	33	56	4.4
Potential	–	–	11	22	67	4.5

Table 2 Assessment of individual canvases (average rating) on a Likert scale (1–5) in points

	Canvas 1	Canvas 2	Canvas 3	Canvas 4	Canvas 5	Canvas 6
Clarity	4.5	4.3	4.2	4.0	3.3	4.8
Usefulness	4.7	4.6	4.5	4.3	4.1	4.6
Potential	4.8	4.6	4.4	4.3	4.4	4.6

Focusing on each canvas, we asked students to score them individually in three categories: clarity, usefulness, and potential (Table 2). The best score in terms of clarity was given to Canvas 6 (the intervention canvas, see Fig. 7), which was the simplest out of all six, with only the request to detail the intervention step-by-step. The lowest score on clarity was given to Canvas 5 (the opportunity matrix canvas, see Fig. 6), which was considered the most difficult to understand.

The best score in terms of usefulness was given to Canvas 1 (the persona canvas, see Fig. 2), which was often mentioned, even after the class project was complete, as the most novel and perspective-changing canvas. We observed this particularly when students presented the projects and reflected on the experience. The lowest score on usefulness was given to Canvas 5 (the opportunity matrix canvas, see Fig. 6), because, as mentioned above, it was considered the most difficult to understand and apply.

Regarding potential—for idea generation and use in their coaching practice, for example—the lowest score was given to Canvas 4 (metaphor/design vision canvas, see Fig. 5). This canvas was also somewhat difficult to understand—it had the aim of illustrating the *effect* of the intervention, through a metaphor (e.g., "feeling light as a feather"). However, we observed that when used successfully, students were satisfied with its contribution to the project. The highest score in the potential category was Canvas 1 (the persona canvas, see Fig. 2), which, as highlighted above, was mentioned as the strongest overall canvas, and the most perspective-changing.

Following the numeric rating, we asked some open questions about the impact and adequacy of the tools that were presented. On the impact of the presented tools in understanding the process of designing interventions, students mentioned:

- "It is a great framework to create PPIs in a structured and targeted way."
- "[The tools] helped me to focus on my user and to understand them in a much deeper way than if I created ideas in my head without an analysis. So the impact was big."
- "The canvases are very useful to organize ideas and allow the link between problem and resolution to become much clearer."
- "To clarify the creative process with the potential client, to understand the user better, and to reach results."
- "It improves the diagnostic and the intervention methodology."

On impact considering their professional practice, students mentioned:

- "Because I work with people development within organizations, I will be able to use it in my interventions."

- It will shed a lot of light, especially to think and plan new projects and marketing strategies. The empathy mapping (Canvas 2, the empathy canvas, see Fig. 3) is exceptional to amplify the view on the target audience."
- "It can be used in coaching sessions."
- "It can be very useful in the citizenship perspective."
- "I believe that it will be useful to organize my thinking and minimize the action-reaction type of behavior that I tend to have."
- High impact, I intend to use it professionally to assist my business plan development."
- "It is highly adequate for my professional reality."

4 Discussion

4.1 Insights from the Results

Results indicate that design tools can be useful to understand people and groups, and to create an intervention to improve their lives, in the context of positive psychology. In addition, design tools were considered as having a great potential to turn theoretical content actionable, and expedite the process of generating positive psychology interventions.

This leads to two types of insight: first, that design methods and tools are potentially self-explanatory and accessible to be used by non-designers (which had been verified in previous research conducted with children [28], elderly [29], etc.). Second, that the design studio format is applicable in other educational contexts, to convey and apply non-design knowledge—it streamlines interactions, facilitates discussion, and promotes horizontal knowledge transfer.

The study reported in this paper is not about design knowledge or a contribution to the design field, *per se.* Rather, it is about the tools and methods of design, and their ability to streamline (educational) processes in other fields. Just as design (the field of knowledge) often relies on mechanisms from the social sciences, humanities, etc., to improve its own processes and agenda, so it is possible to use the mechanisms of design to advance other domains of expertise. Whereas design often resorts to methods and tools from other disciplines—e.g., anthropology, sociology, psychology [30, 31]—the opposite is not so common. With this exercise, we aimed to explore the possibility of using mechanisms from design to bring value to the educational settings of other fields.

4.2 Implications for the Future of Education

We propose that design tools and educational modalities (like workshops, or studio classes) are appropriate to introduce into other disciplines, while simultaneously

considering their specific needs and aims—like a *glocalized* approach to education: general and globalized, yet specific and localized. We call this *designerly* approach to education *Education through Design.*

The designation *Education through Design* is not necessarily new. It has been used previously to describe ways to improve design education [32]. Our proposal, however, is a parallel to Frayling's [32] concept of Research through Design, meaning designerly ways of teaching. The concept of Research through Design (RtD) proposes using the distinctive perspective of design to understand and intervene in diverse settings outside the field of design, mapping contexts, people, opportunities, problems, and solutions. Similarly, design pedagogy offers a unique set of mechanisms—including the use of design-based tools, methods, and the studio classroom setting—that can be valuable for other fields [33]. This is particularly the case in fields that already use design-like approaches in education, as the one illustrated in this paper.

This proposal seems to be of particular relevance in the context of the future of education, from two perspectives. Firstly, from a convergence tendency perspective, as observed by the streamlining of higher education at a European level—for example, in the ongoing discussion on the Bologna process [e.g., 35].

> While European Union member states do not show the specific desire to delegate control in matters of education, there is a progressive tendency convergence in terms of resulting degrees (e.g., ECTS system, mobility programs, the Bologna process). Since the member states are included in an intergovernmental and supranational system, and share common legislation in many policy areas, ideas about how to teach might be valuable to test, propose, and replicate, to create a globalized direction towards better education. [36, p. 601]

Secondly, this design-based approach to education might potentially be useful to reach twenty-first century education goals and skills [e.g., 37], further contributing to the debate of quality in education. The Knowledge Age brings with it both possibilities and barriers. We must address both to provide a more adequate, competitive, and modernized education. The proposal presented here can be a potential pathway for this, however it needs further work, both conceptually and in terms of validation.

4.3 Limitations and Future Research

The class reported in this paper was carried out in the context of a two-class module, a theoretical class and a practical, applied one. Due to administrative issues, the practical class—the one reported here—was given first. Consequently, students did not have a sound theoretical basis prior to the practical class. This led to some difficulties in the understanding and application of concepts, which had to be bypassed by ongoing explanations throughout the exercise. This influenced the assessment of the class quality and of the respective material, rendering it (seemingly) less useful—as indicated in some open-ended questions (35% of questionnaire respondents considered this issue as hindering content comprehension).

Furthermore, the current proposal is focused on results from a small sample and a single exploration. A larger sample, with several groups, would provide a more

accurate picture of how these tools and mechanisms affect the education of fields outside of design. It also reports results from the field of psychology and specifically from the branch of positive psychology. As such, more research can focus on other fields, and even other branches of psychology, to understand the proposal's value.

For the setup of the class exercise, we opted to use a studio-based modality. It is relevant to note that not all scholars focusing on design education agree that studio-based learning is worth pursuing, mentioning that there is little foundation to support its value. In fact, some research argues that this modality can be inappropriate as it is often directly based on the master-apprentice model of learning, which in turn is often not a promising way to teach because it does not value the intellectual development of the student [35].

The Research through Design (RtD) approach, proposed by Freyling [32], focuses on designerly ways of conducting research with knowledge (and for new knowledge) outside of design. RtD, thus, was our starting point to propose an Education through Design approach (EtD). Analogously, it would correspond to the use of designerly ways of teaching and learning that are applied in other fields. Future research can develop this concept further, carrying out experiments to attest its value.

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