

ISTANBUL TECHNICAL UNIVERSITY ★ GRADUATE SCHOOL

**A FRAMEWORK FOR THE EMBODIMENT OF EMPATHY IN DESIGN
EDUCATION: EXPLORING EMPATHIC PERSPECTIVE-TAKING OF
DESIGN TEACHERS IN DESIGN CONVERSATIONS**



Ph.D. THESIS

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Department of Industrial Design

Industrial Product Design Programme

JUNE 2024

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JUNE 2024

İSTANBUL TEKNİK ÜNİVERSİTESİ ★ LİSANSÜSTÜ EĞİTİM ENSTİTÜSÜ

**TASARIM EĞİTİMİNDE EMPATİNİN SOMUTLAŞMASI İÇİN BİR
ÇERÇEVE: TASARIM EĞİTMENLERİNİN TASARIM
KONUŞMALARINDAKİ EMPATİK BAKIŞ AÇILARINI KEŞFETMEK**

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To my mom and dad,



FOREWORD

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A FRAMEWORK FOR THE EMBODIMENT OF EMPATHY IN DESIGN EDUCATION: EXPLORING EMPATHIC PERSPECTIVE-TAKING OF DESIGN TEACHERS IN DESIGN CONVERSATIONS

SUMMARY

The sophisticated and multi-layered phenomenon of empathy has become an essential aspect of design research and design practice. However, the connections of this phenomenon with design education are indirect and ambiguous as well as have not yet been clarified. Thus, the dispersed nature of empathy in design education invites us to explore and address this phenomenon with the context of both conceptual and practical research objectives.

This thesis study is prepared in regard to three phases going deeper considering research objectives that are addressed under four different studies. The first phase (scanning horizon) focuses on a systematic identification and analysis of the relevant literature overlapping design education and the concept of empathy. Under this phase, two preliminary studies based on systematic literature review are conducted to map the dimensions of empathy in design education (Chapter 2) and to reveal the impacts on design learning and teaching (Chapter 3). The second phase (deep diving) based on a participant observation study addresses how empathy is embodied in the design studio, so explore the empathic indicators embedded in design conversations (Chapter 4). Lastly, the third phase (mining together) based on a pedagogical probe study centres upon the underlying motives behind empathic perspective-taking of design teachers during design conversations (Chapter 5).

In the first study (Chapter 2), a systematic scoping review study is adopted as a technique to map the field of interest. The dataset is analysed via qualitative content analysis method to uncover and map the hidden dimensions of empathy in design education. The analysis reveals three dimensions of empathy, such as *educational interventions*, *aspects* and *contexts of empathy*. Educational interventions are the implementations applied or discussed in the articles with special attention to the learning and teaching activities, connecting with empathy. The aspects of empathy are the materialisation of empathy with specific educational purposes. Finally, the context of empathy represents the distinctive contexts in which learning takes place, induced by empathy. These interwoven dimensions help us to generate an integrative framework of the relevant literature. Based on this integrative framework, particular implications are proposed, such as research-based implications for design education researchers, pedagogical implications for design teachers and institutional implications for decision-makers. This chapter entitled “Mapping three dimensions of empathy in design education: Educational interventions, aspects and contexts” is published in the journal *Art, Design & Communication in Higher Education*.

It is understood that empathy considerably transforms learning processes and teaching activities. Thus, aiming to explore and discuss the impacts of empathy on learning and teaching in the relevant design education literature, the systematic scoping review study is analysed thematically the second study (Chapter 3). Eight themes appear in

this study, such as *cognitive, affective, interactive, collaborative, operative, perceptive, formative* and *connective impacts*. All these impacts are mostly in relation to design learning; however, the impacts of empathy on teaching activities are relatively limited. Within the context of this study, the research gaps for further studies are also addressed, as well as methodological and pedagogical implications are presented. This chapter entitled “A deep dive into the impacts of empathy on design learning and teaching” is published in the International Journal of Technology and Design Education.

The first phase (scanning horizon) helps to scan the relevant literature intensively and unfold the implicit nature of empathy by uncovering the dimensions of empathy in design education and its impacts on design learning and teaching. These studies also illustrate particular research gaps in the relevant literature underlining the less-concentration on in-studio interactions between design teachers and learners as well as the development of empathic ways of teaching.

In the following study (Chapter 4), empathy is addressed as an embodied happening in design studio conversations between design teachers and students. In this study, empathy embedded in design studio conversations is highly associated with perspective-taking of design teachers to ensure empathic understanding with design students. In participant observation studies conducted at two universities in Finland and Türkiye how design teachers take the perspective of other agencies and what deliveries are utilised for empathic perspective-taking are traced. The findings of the ethnographic content analysis show that design teachers take the perspectives of both human and non-human agencies during design conversations, such as *design students, users, and materials*. Moreover, they utilise *discursive* and *performative deliveries*, which lead to the identification of design teachers with these agencies. It is understood that design teachers’ perspective-taking of design students during design conversations has particular effects on enhancing the learning experiences. Moreover, perspective-taking of design teachers towards users and materials help students to observe and understand the implications of design. This chapter entitled “Eliciting empathy embedded in design conversations: Empathic perspective-taking of design teachers towards design students, users and materials” is published in the International Journal of Art and Design Education.

This second phase (deep diving), which is the core study of this thesis, dives deeply into design studio education and teaching activities, starting from the embodiment of the empathy phenomenon. Design conversations are focused, which are the backbone interactions in the design studio. This study exploring the implicit nature of design conversation is an initial step to frame the empathic approaches of design teachers.

Aiming to develop an in-depth understanding specific to empathic approaches of design teachers in design conversations, in the last study (Chapter 5), empathic perspective-taking phenomenon in design teaching is addressed. To dig into the motives of design teachers behind empathic perspective-taking in design conversations, a pedagogical probe study based on self-documentation and reflection on design teaching approaches is conducted with the participation of design teachers and supporting teaching staff. A directed approach to qualitative content analysis is used for the data analysis in this study to explore the underlying motives behind perspective-taking. There appear distinctive *intentions of design teachers* cultivated from *personal motivations* that have *potential impacts on learning processes*. This chapter is an in-review process in an international peer-reviewed journal.

The third phase (mining together) helps to expand the knowledge around empathic perspective-taking and presents it in all its aspects via a participatory approach. As an empathic approach, allocentric perspective-taking of design teachers in design conversations can serve for the designerly way of thinking and enhancement of learning activities, the motivation and inspiration of design students particularly.

In conclusion, both conceptual and practical implications of this thesis are discussed. The conceptualization of design teachers' perspective-taking as an empathic action in design conversations is addressed through the synthesis of the findings. It is understood that design teachers may face multiple traps to fall on the way of taking a perspective in design conversations. Moreover, the development of practical pedagogical tools and exercises at personal, collective and institutional levels are encouraged. Via new pedagogical tools, design teachers and supporting teaching staff can raise their own awareness, ensure their well-being, reflect each other and become empowered in a pedagogical sense.

This thesis can be taken as an attempt to bring a new perspective and pedagogical approach to design studio conversations in the quest of empathic design education. Raising awareness of design teachers in this context can make it possible for the development of empathic design teachers and teaching approaches. By this way, more empathic interactions in the design studio education can be established.



TASARIM EĞİTİMİNDE EMPATİNİN SOMUTLAŞMASI İÇİN BİR ÇERÇEVE: TASARIM EĞİTMENLERİNİN TASARIM KONUŞMALARINDAKİ EMPATİK BAKIŞ AÇILARINI KEŞFETMEK

ÖZET

Karmaşık ve çok katmanlı bir fenomen olan empatinin tasarım alanındaki kökleri tasarım araştırmalarına ve pratiğine dayanır. Ancak bu olgunun tasarım eğitimi ile olan bağlantıları dolaylı ve muğlak olup henüz aydınlatılamamıştır. Dolayısıyla bu olgunun tasarım eğitimindeki dağılık doğası bizi bu olguyu hem kavramsal hem de pratik araştırma hedefleri bağlamında keşfetmeye ve ele almaya davet etmiştir.

Bu tez çalışması, dört farklı çalışma kapsamında ele alınan araştırma hedefleri dikkate alınarak, üç aşamayı kapsayacak şekilde hazırlanmıştır. İlk aşama olan “ufku tarama” (*scanning horizon*) aşaması, tasarım eğitimi ve empati kavramıyla örtüşen ilgili literatürün sistematik bir şekilde tanımlanmasına ve analizine odaklanır. Bu aşamada, tasarım eğitiminde empatinin boyutlarını haritalamak (Bölüm 2) ve tasarım öğrenimi ve öğretimi üzerindeki etkilerini ortaya çıkarmak (Bölüm 3) için sistematik literatür taramasına dayalı iki çalışma yürütülmüştür. Katılımcı gözlem çalışmasına dayanan ikinci aşama olan “derinlemesine dalış” (*deep diving*) aşamasında ise, tasarım stüdyosunda empatinin nasıl somutlaştığı ele alınmıştır. Bu bağlamda, tasarım kritikleri (*design critiques*) ve jürilerine (*design juries*) dayanan tasarım konuşmalarına (*design conversations*) yerleşmiş empatik göstergeler takip edilmiştir (Bölüm 4). Son olarak, pedagojik bir araştırma çalışmasına dayanan üçüncü aşama “birlikte çıkarma” (*mining together*) adımıyla ise, tasarım eğitmenlerinin tasarım konuşmaları sırasında empatik bakış açısı edinmelerinin (*empathic perspective-taking*) ardındaki temel güdülere odaklanılmıştır (Bölüm 5).

İlk çalışmada (Bölüm 2), empati ve tasarım eğitiminin kesişen literatürünü belirlemek için sistematik bir kapsam inceleme çalışması (*scoping literature review*) yürütülmüştür. Veri seti, tasarım eğitiminde empatinin gizli boyutlarını ortaya çıkarmak ve haritalamak için nitel içerik analizi yöntemiyle analiz edilmiştir. Analiz, eğitimsel müdahaleler, empatinin yönleri ve empatinin bağlamları olmak üzere üç boyutu ortaya koymuştur. Eğitimsel müdahaleler (*educational interventions*), öğrenme ve öğretme etkinliklerine özgü, empatiyle ilişkilendirilerek uygulanan veya makalelerde tartışılan uygulamalardır. Empatinin yönleri (*aspects of empathy*), empatinin belirli eğitsel amaçlarla hayata geçirilmesidir. Son olarak, empati bağlamı (*contexts of empathy*), empatinin tetiklediği öğrenmenin, gerçekleştiği farklı bağlamları temsil etmektedir. Bu iç içe geçmiş boyutlar, ilgili literatürün bütünleştirici bir çerçevenin (*integrative framework*) oluşturmasında yardımcı olmuştur. Bu çerçeveye dayanarak, tasarım eğitimi araştırmacıları için araştırmaya dayalı çıkarımlar, tasarım eğitmenleri için pedagojik çıkarımlar ve karar vericiler için kurumsal çıkarımlar gibi belirli çıkarımlar önerilmiştir. Bu bölüm, *Art, Design & Communication in Higher Education* dergisinde yayınlanmıştır.

Empati, öğrenme süreçlerini ve öğretme etkinliklerini önemli ölçüde dönüştürmektedir. Bu nedenle, ilgili tasarım eğitimi literatüründe empatinin öğrenme

ve öğretme üzerindeki etkilerini araştırmayı ve tartışmayı amaçlayan sistematik kapsam inceleme çalışması (*scoping literature review*), ikinci çalışmada (Bölüm 3) tematik olarak analiz edilmiştir. Bu çalışmada bilişsel (*cognitive*), duyuşsal (*affective*), etkileşimli (*interactive*), müşterek (*collective*), işlevsel (*performative*), algısal (*perceptive*), biçimlendirici (*formative*) ve birleştirici (*connective*) etkiler gibi sekiz tema ortaya çıkmıştır. Tüm bu etkilerin çoğunlukla tasarım öğrenimi ile ilgili olduğu, ancak empatinin öğretim faaliyetleri üzerindeki etkilerinin ilgili literatürde nispeten sınırlı bir şekilde ele alındığı olduğu ortaya çıkmıştır. Bu çalışma kapsamında, ileriki çalışmalarda ele alınabilecek araştırma boşlukları da belirlenmiş, ayrıca metodolojik ve pedagojik çıkarımlar sunulmuştur. Bu bölüm, *International Journal of Technology and Design Education* dergisinde yayınlanmıştır.

Bu iki çalışmayı kapsayan “ufku tarama” aşamasında, tasarım eğitiminde empatinin boyutlarını ve tasarım öğrenimi ve öğretimi üzerindeki etkilerini keşfederek ilgili literatürün yoğun bir şekilde taranması ve empatinin örtük doğasının ortaya çıkarılması sağlanmıştır. Bu çalışmalar, aynı zamanda ilgili literatürdeki belirli araştırma boşluklarını da göstermektedir. Tasarım eğitmenleri ve öğrencileri arasındaki stüdyo içi etkileşimlerine ve empatik öğretim yöntemlerinin geliştirilmesine daha az odaklanıldığı anlaşılmıştır.

Bir sonraki çalışmada (Bölüm 4), tasarım eğitmenleri ve öğrencileri arasındaki tasarım stüdyosu konuşmalarında (*design conversations*), empatinin nasıl somutlaştığı incelenmiştir. Bu çalışmada, tasarım stüdyosu konuşmalarına gömülü olan empati, tasarım eğitmenleri tasarım öğrencileriyle empatik bir anlayış sağlamak için bakış açısı almalarıyla (*perspective-taking*) ilişkilendirilmiştir. Finlandiya ve Türkiye'deki iki üniversitede yürütülen katılımcı gözlem çalışmalarında, tasarım konuşmalarında eğitmenlerin kendilerinden başka aktörlerin bakış açılarını nasıl ele aldıkları ve empatik bakış açısı edinme için hangi iletişim biçimlerinden yararlandıkları incelenmiştir. Etnografik içerik analizinin bulguları, tasarım eğitmenlerinin tasarım konuşmaları sırasında tasarım öğrencileri, kullanıcılar ve materyaller gibi hem insan hem de insan olmayan aktörlerin bakış açılarını aldıklarını göstermektedir. Dahası, tasarım eğitmenlerinin bu aktörlerle özdeşleşmesini sağlayan söylemsel ve performans dayalı iletişim biçimlerinin kullanıldıkları anlaşılmıştır. Tasarım eğitmenlerinin tasarım konuşmaları sırasında, tasarım öğrencilerinin bakış açısını benimsemeleri, öğrenme deneyimlerini geliştirmede özellikle etkili olduğu anlaşılmıştır. Ayrıca tasarım eğitmenlerinin kullanıcılara ve materyallere yönelik bakış açılarını benimsemeleri de, öğrencilerin kendi tasarımlarının sonuçlarını gözlemlmelerine ve anlamalarına yardımcı olmaktadır. Bu bölüm, *International Journal of Art and Design Education* dergisinde yayınlanmıştır.

Bu tezin temel çalışmasını içeren “derinlemesine dalış” aşaması, empati olgusunun somutlaşmasından yola çıkarak tasarım stüdyosu bağlamındaki eğitim ve öğretim faaliyetlerine derinlemesine dalmıştır. Tasarım stüdyosundaki omurga etkileşim olan tasarım konuşmalarına odaklanmaktadır. Tasarım konuşmasının örtük doğasına odaklanan bu çalışma, tasarım eğitmenlerinin empatik yaklaşımlarını çerçevelemek için bir adım olmuştur.

Tasarım eğitmenlerinin tasarım konuşmalarındaki empatik yaklaşımlarına özgü derinlemesine bir anlayış geliştirmeyi amaçlayan son çalışmada (Bölüm 5) ise, tasarım öğretiminde empatik bakış açısı alma (*perspective-taking*) olgusu ele alınmıştır. Tasarım eğitmenlerinin tasarım konuşmalarında empatik bakış açısı edinmelerinin ardındaki motivasyonları araştırmak için, tasarım eğitmenlerinin ve destekleyici

öğretim personelinin katılımıyla, kendi tasarım öğretim yaklaşımları üzerine düşünmeye ve belgelemeye dayalı bir pedagojik araştırma çalışması (*pedagogical probe study*) yürütülmüştür. Bakış açısı almanın altında yatan nedenleri araştırmak amacıyla, bu çalışmada yönlendirilmiş nitel içerik analizi (*directed qualitative content analysis*) yaklaşımı kullanılmıştır. Tasarım eğitmenlerinin tasarım konuşmalarındaki bakış açısı alma pratiklerinin arkasında farklı kişisel motivasyonlarının (*motivations*) olduğu, bunların ilgili pratiklerdeki amaçlarını (*intentions*) şekillendirdiği ve öğrenme süreçleri üzerinde potansiyel etkileri (*potential impacts*) olduğu anlaşılmıştır. Bu bölüm uluslararası hakemli bir dergide değerlendirme sürecindedir.

Son aşama olan “birlikte çıkartma”, empatik bakış açısı edinme konusundaki bilginin genişletilmesine yardımcı olarak, katılımcı bir yaklaşım ile tüm yönleri ortaya koymuştur. Empatik bir yaklaşım olarak, tasarım eğitmenlerinin tasarım konuşmalarında diğer-merkezli (allocentric) bakış açılarını almaları, öğrencilerin tasarımcı düşünme ve öğrenme biçimlerinin gelişmesine hizmet etmektedir. Özellikle de, tasarım öğrencilerinin motivasyonlarını ve ilham almalarını sağlamaktadır.

Sonuç olarak, bu tezin hem kavramsal hem de pratik çıkarımları tartışılmıştır. Tasarım eğitmenlerinin bakış açısı edinmelerinin tasarım konuşmalarında empatik bir eylem olarak kavramsallaştırılması, bulguların sentezi yoluyla ele alınmıştır. Tasarım eğitmenlerinin tasarım konuşmalarında bakış açısı edinme yolunda birçok tuzakla karşılaşabilecekleri ön görülmektedir. Ayrıca kişisel, kolektif ve kurumsal düzeydeki pedagojik araçların ve egzersizlerin geliştirilmesinin önemine değinilmiştir. Yeni pedagojik araçlar aracılığıyla tasarım eğitmenleri ve destekleyici öğretim elemanları kendi farkındalıklarını artırabilir, refahlarını sağlayabilir, birbirleri ile paylaşabilir, ve pedagojik anlamda güçlenebilirler.

Bu tez, empatik tasarım eğitimi arayışında tasarım stüdyosu konuşmalarına yeni bir bakış açısı ve pedagojik yaklaşım getirme girişimi olarak değerlendirilebilir. Tasarım eğitmenlerinin bu bağlamda farkındalıklarının arttırılması, empatik tasarım eğitmenlerinin ve öğretim yaklaşımlarının geliştirilmesini mümkün kılabilir. Bu sayede tasarım stüdyosu eğitiminde daha empatik etkileşimler kurulabilir.



1. INTRODUCTION

This chapter introduces the motivation of the researcher for this thesis and carries on with the background of the research, the problem statement, the research objectives and questions. A brief explanation of the thesis structure and the publications are also delivered. Moreover, the triangulation combinations of the thesis that represents the research design is addressed under this section.

1.1 Motivation of the Researcher

When I ended my undergraduate adventures and started to work as a research assistant in a university, I found myself questioning my own competencies and responsibilities as a future design teacher. As someone who was just a student, I suddenly found myself taking on completely an opposite role identity in teaching, where I found inadequate at some of the points. I can say that this was the initial cornerstone of my struggle with the phenomenon of “how to be a better design teacher.”

My student experiences reminded me of how the interaction with my teachers in the design studio courses affected my learning process, and I realised that I was now at a point where I could negatively or positively influence student's attitude towards design. I started to feel responsible for correcting the things I complained about when I was a student, wondering whether it was right to be a new practitioner of the design education that I had seen from my teachers and witnessed all the traumas of when I was a student, what I could improve, and what a better design education could be like.

What made things even more complicated for me was that the role I assigned to myself as a research assistant in the academic community and the role assigned to me by administrative or academic people within the institute were quite different. I can say that this gap, questioning my role and my peers' in the academic community, turned into an adventure of learning my position in a design studio course. This questioning, together with my increasing awareness in the “Design Pedagogy” course conducted by my supervisor Assoc. Prof. Dr. Koray GELMEZ, I took in the first semester of my

doctorate, led me to carry out academic studies and funded research projects in which I tried to explore and learn the pedagogical roles of design teachers (Efilti and Gelmez, 2021) and research assistants (Efilti and Gelmez, 2023a; Efilti et al., 2022; Gelmez et al., 2021).

Following this, my quest to develop design education-specific tools to improve the interaction between design teachers and students sparked this doctoral thesis. It enabled me to discover the importance of two important actors of the design studio understanding each other through empathy in design practice. As a motivation, this doctoral study was a process for me in which I tried to learn how to improve my own teaching approach in practice and how to become a better design educator. This study was a journey in which I understood that the meaning of being better was to develop empathic understanding and continue the learning process as a future design teacher.

1.2 Background of the Study

This doctoral thesis has been carried out and prepared based on the regulations established by Istanbul Technical University Graduate School for the doctoral theses from at least three published scientific articles (LEE, 2020). For this reason, each chapter represents a publication in which a focused literature and/or theoretical discussions are presented. Thus, there are some repetitions in the chapters.

In this current section, fundamental concepts of design studio education, design teacher-student interaction, including design conversation, power relations, and pedagogical roles, as well as the phenomenon of empathy, including empathy in design and design education, that form the basis of this study are addressed briefly.

1.2.1 Design studio education

According to Dewey (1929, 1938), learning is experiential and occurs through personal experience interwoven with reflective thinking. This approach to education is aligned with constructivist learning theory in which knowledge and meaning are generated by the experiences of the learner (Ferreira, 2018a). From the constructivist perspective, the objectives of student design learning are specified, such as the cognitive process related to thinking and knowledge, the affective process related to feeling, attitude and emotions and the psychomotor process related to making (see Anderson et al., 2001; Bloom et al., 1956; Krathwohl, 2002; Krathwohl et al., 1964).

Under this theory, the "student-centred" education is one of the most well-known perspectives in contemporary educational discourse (Krahenbuhl, 2016). Student-centred education identifies students as the owners of their learning processes (Lee and Hannafin, 2016). In short, to promote a student-centred design education, teaching activities are developed in ways that can enhance student learning (Wright, 2011).

Design education mainly relies on this educational paradigm of "learning by doing" (Goldschmidt et al., 2010; Schön, 1983) distantly originated the mediaeval apprenticeship system (master-apprentice model) (Goldschmidt et al., 2010; Salama, 1995; Schön, 1985; Utaberta et al., 2013). In this system, apprentice designers work and become experienced in a master's atelier to have sufficient knowledge and expertise; and thus, to be able to operate independently (Goldschmidt et al., 2010). Hence, learning by doing as a form of experiential learning is particularly effective, especially in terms of acquiring hands-on skills (Gelmez, 2016). This model was then adopted by the academies and modern-day universities as a preferred method of design teaching (as cited in Ferreira, 2018a).

The studio practice in design is based upon the "atelier" teaching model of École des Beaux-Arts in the nineteenth century (Tok and Ayyıldız Potur, 2016; Wang, 2012). The ateliers are seen as the predecessors of today's design studios (Cossentino, 2002). Today, design studio refers to both the project courses and the environments in which the design courses are conducted (Gelmez, 2016).

In contemporary professional education, the design studio embraces uncertainty, uniqueness, conflicted situations and confusion (Schön, 1988). It is a controlled educational environment (Ferreira, 2018a), where design students individually or collectively undertake design projects (Goldschmidt et al., 2010; Schön, 1985). We can say that it includes "practical design exercises of increasing complexity" (Ferreira et al., 2016, p. 113). Design studio course is a focal point of design curricula (Ferreira, 2018a; Goldschmidt et al., 2010; Tok and Ayyıldız Potur, 2016) based upon the design project experience, which is the core of the learning path of learners (McDonnell, 2014). As a pedagogical approach to design education, the process of executing a design project relies on a "doing and making" that represents learning itself in a material form, such as "an artefact, a performance, a design, a portfolio" (Shreeve, 2015, p. 87).

Learning in design studio has been theorised as a signature pedagogy, which represents a distinctive form of teaching to be associated only with a particular profession (see Shreeve, 2015; Shulman, 2005; Williams, 2017). The central pedagogical concept of a design studio is defined by Schön (1988) as “a reflective practicum in designing” (p. 4) which is not a problem-solving activity but is the form of a reflective conversation of the learner with the situation (p. 93). This represents a trial-and-error practice based upon active learning, the recognition of tacit knowledge, creativity and reflection-in-action (Schön, 1983; Wang, 2012).

In a design studio, students learn through studying on design projects (Oh et al., 2013), thus simulate a professional design experience, which is a vocational manner to mirror industrial activity and practices (Hall, 2010), under the guidance and criticism of design teachers who are expert educators or experienced designers (Ferreira, 2018a; Goldschmidt et al., 2010; Schön, 1985). This way of teaching allows them to better equip their professional repertoire, based on experiences of various design approaches and methods (Goldschmidt et al., 2010). During design projects, undergoing multiple iterations, design students are working on complex and open-ended assignments (Kuhn, 2001), which are “ill-defined problems” (Schön, 1985) having multi variables and solutions, and are expected to develop a refined design idea being “original” in context (Ochsner, 2000). This occurs in a temporary balance between the constraints of the design project and the proposed solutions of the students (Ferreira, 2018b).

As a common practice, throughout an entire semester, design students have design studio meetings, where they present and discuss their work in progress with their teachers, classmates, and also sometimes with guests (Goldschmidt et al., 2010). The design project engages the teacher and student in a practical conversation (Ferreira, 2018b). In the design studio, students receive formal or informal “design critiques” regarding their projects from teachers, peers, and guest experts (Kuhn, 2001; Wang, 2012). Through executing and presenting their projects, receiving design feedback from studio people, reflecting on and revising their works, design students are “playing with design” (Ochsner, 2000) and devote a great energy and considerable time in studio learning (Oh et al., 2013). As “a vehicle for education in artistry” (Schön, 1985, p.8), this educational environment is a unique type of course and a typical for creative practice-based disciplines like architecture, graphic design, industrial design, interior

design, or fashion design, product design, and urban design (Ferreira, 2018a; Goldschmidt et al., 2010).

In this respect, the studio is a place where the aspects of learning rely on social and active participation and contribution of learners to the practices of their communities (Wenger, 1998) rather than passive recipients (Bowles et al., 2017). Underpinning socio-cultural aspects, learning is based on student engagement in design studio courses (Belluigi, 2016). Vygotsky's (1978) socio-cultural educational theory also draws attention to the effects of interaction, language and culture on learning processes, asserts the conception of learning that can be constructed through an established dialogue and by a social interaction. Thus, studio learning of design students is primarily based on their interactions and dialogues with their teachers and peers (Oh et al., 2013).

The design community has its own culture, networks and languages (Shreeve, 2015), and the people of design studio form the presence of this educational setting through their actions and interactions (Williams, 2017). The studio holding learners' "emerging identities as practitioners" and acting as a site for reflecting the social and embodied forms of practice manifests "situated learning" that is fundamentally a social process (Lave and Wenger, 1991). In this community of practice (Wenger, 1998), studio members working alongside on similar tasks in face-to-face contact in a shared learning environment elaborate studio culture with "peripheral collaborative and social activities concerned with identity and sense of place" (Williams, 2017, p. 92). According to Ledewitz (1985), the major pedagogical objective of the design studio is to learn new skills, a new language, and the way of designerly thinking. Herewith, in the design studio setting,

... students learn to become members of a community of practice, where the relationships between different members of that community are negotiated, where the ethos of an individual as a designer is voiced, where independent thinking is nurtured, where the culture of egalitarian working space can emerge, where social relationships and professional identities are developed and where self analysis and reflection are mastered. (Scagnetti, 2017, p. S781)

However, instead of the collaborative learning culture and the communal solidarity in the studio environment, it can turn into a highly competitive habitus among students.

Thus, they may tend to hide their idea, projects, and drawings from each other (Dutton, 1991).

1.2.2 Teacher and student interaction in the design studio

Studio-based learning within the context of design education contains “its own culture, including its own language, norms, rituals” (Schön, 1988, p. 6) and dynamics that are essentially constructed on the interactions between design teachers and students. The interaction between design teacher and student through the design project is the fundamental aspect of the design studio course (Ferreira et al., 2016; Wender and Roger, 1995). This interaction, which is a rich source of knowledge (Goldschmidt et al., 2010), greatly determines the efficiency of the teaching and learning processes (Ferreira, 2018a; Webster 2004, 2005). Moreover, the enhancement of the educational outcomes in the design studio are embodied via this social relation (Abdelaziz, 2021).

Verbal interaction between design teacher and student is a key in defining the design studio (Demirbas and Demirkan, 2003; Wender and Roger, 1995). According to Wender and Roger (1995), these verbal interactions in the design studio are guided by particular internal and external determinant factors, such as “the design project and the studio environment, the student's internal expectations, the student's expectations, the student's attributes and processes, the teacher's internal expectations, teacher's external expectations and the teacher's attributes and processes” (pp. 324-325).

The primary social interaction between design teachers and students in a design studio hinges upon the “design conversation” which is “a close and personal dialogue about the student’s unfolding design project” (Ferreira, 2018b, p. 1). Design conversations between teachers and students are largely vague which include tacit, implicit, intangible knowledge regarding the design process, so neither has a fixed duration nor end up with specific outcome (Ferreira, 2018b). “What normally remains tacitly understood in the realm of design practice” can be made visible through dialogue (Shreeve, 2015, p. 88). As a particular aspect of design education, design conversations also make “the process of designing clear and explicit” for the students through unprompted verbalisations and visualisations (Ferreira et al., 2016; Oak, 2006). Thus, these interactions in the design studio aspires to “assist students in more fully understanding the nature of their work and to increase their abilities to make sound critical judgement” (Peterson, 1979, p. 64).

1.2.2.1 Design conversation

Entailing a back-and-forth interaction, design conversations function as a pedagogical venue (Webster, 2006) in the design studio setting. Relying on the discourse focused on talk about designing (Ferreira, 2018) regarding the design project and process of the student, design teachers and students meet in critic-centred events (Sipahioğlu, 2012), such as one-to-one desk critiques, group critiques, and formal design juries.

In the literature, design conversation can be called design crit, critics, critique, review, feedback, dialogue, discussion, etc. (see Goldschmidt et al., 2010; Kuhn, 2001; Uluoglu, 2000), which is considered as the “backbone” of design studio courses (Uluoglu 2000). As a defining feature, this particular interaction is a social activity and can be seen as a signature pedagogy in design education (see Ferreira, 2018a; Shreeve, 2015). Directly informing the practice of making (Scagnetti, 2017), design conversation is largely conducted using a design language composed of verbal and visual expressions, which is “a language game that the teacher models for the student” (Ferreira, 2018a, p. 17). In this interactive and reciprocal conversation, the language of designing enfolds talking, listening, and drawing together (Ochsner, 2000; Schön, 1984). Teachers and students together look at the students’ representations brought into the design studio setting, such as, design sketches, schemes, models, prototypes or conjectures (Ochsner, 2000) that undergo multiple and rapid iterations (Kuhn, 2001).

In the individual critiquing sessions at desk crits, teachers and students can work on, exchange and discuss their design idea, and imagine possibilities and design consequences together (Demirbaş and Demirkan, 2003; Kuhn, 2001; Mewburn, 2012). This “exchange” between design teachers and students is the pedagogical practice that both models the way designers think and encourages students to apply it (Shreeve, 2015). Moreover, the critique can be an event in which students participate in “pin-ups” and present their works in a public setting, in which students literally “pin their drawings to the wall and discuss their work with critics” (Kuhn, 2001, p. 350). In these events, students can receive feedback from the teachers, peers, and visiting experts as well (Dannels and Martin, 2008). Therefore, design teachers can provide feedback on student work based on their teaching profiles and repertoire from their expertise and professional experiences (see Goldschmidt et al., 2010; Oh et al., 2013). Receiving feedback about their works assists design students to comprehend the complexities of

the problems, gradually solve fallacies in their proposals, as well as build their own repertoire (Oh et al., 2013). According to Ochsner (2000), in parallel to the psychoanalytic model, the design conversations between teachers and students rely on catechetical interactions and “the question and answer be neutral” to promote the self-discovery of the students (p. 199). Design conversations consider “heterogeneous issues ranging from structural integrity to the social impact of the design” (Kuhn, 2001, p. 350). Kuhn (2001) discusses this interaction as an “odd method of progression - raising topics, considering them, and then often moving on to other issues without clear resolution of earlier concerns” (p. 350). However, during the design conversation, which is conceptualised as reflective education, the understanding between design teachers and students is gradually achieved, thus and so, they are able to “finish each other’s sentences” (Wang, 2012, p. 175).

Including intermediate and final juries, design juries are also highly-valued critic-centred formal meetings between teachers and students in the design studio setting. As key symbolic events in design education, the literature emphasises that design juries are the most memorable and outstanding moments (Webster, 2006, 2007) in the learning processes of students with their positive and negative aspects (Ilgaz, 2009). Design juries held in the design studio for collective celebration of the end of a design project (Webster, 2007), so “has the character of ceremony or ritual in the design studio” (Oh et al., 2013) with the aim of assessment (Gelmez, 2016).

In the traditional design studio, the type of “open jury” is very common that refers to the public presentation of students in front of the jury members and audiences, who are the rest of the students of the studio or others who are interested in. Juries are generally composed of “jurors,” from both internal members, who are faculty members including course teachers and supporting teaching staff, and external members, who can be teaching staff from other departments/faculties/universities, professionals working outside the university, stakeholders, clients, etc. (see Ilgaz, 2009; Oh et al., 2013). Design conversations in the design juries function as assessment practices, so jury members review and evaluate the students' projects and performances in primarily “judgemental” ways as well as the audiences are free to ask questions or make comments (see Ilgaz, 2009; Kuhn, 2001; Webster, 2007).

1.2.2.2 Power relations in teacher-student interaction

Design studios intertwined with the complex interplay of ideology and power are hierarchical in their social structure that drive teacher and student interaction (Dutton, 1991), so design conversations. The maldistribution of power relations in the design studio prevents the presence of the “real dialogue,” which relies on the equal distribution of power and the condition of balanced participation of both parties (Dutton, 1991). In any system of hierarchy, which is the absence of the equal distribution of power, dialogical inequalities damage the “authentic conversation” (Krippendorf, 2009). While this core studio interaction defines a mutual dialogue between design teacher and student, design conversation rarely exists in an authentic way (Dutton, 1991).

Freire (1970) frames the “banking” concept of education that is “suffering from narration sickness” (p. 71) as an “act of depositing” (p. 72) teachers make. In this concept, education serves to annul the power of students -objects of education- filled by making deposits by “bank-clerk” teachers -subjects of education- who possess the knowledge that students need to know without making any effort to communicate (Freire, 1970). Adopting the world of oppression, banking education considers students passive entities who are recipients of communiques without participating in a process of communication (Ordóñez, 1981). According to Dutton (1991), also in the studio setting, “usually structured in vertical relations, teachers tend to speak in ways (often unconsciously) that legitimise their power and students orient their speech and work to that which is approved” (p. 18). Some conventional educational conceptions, such as source of expertise or master role from master-apprentice model (see Goldschmidt et al., 2010; Oh et al., 2013), analyst or therapist role from psychotherapy (see Ochsner, 2000), and assessor-critic role from hegemonic overlord model (see Webster, 2004) promote asymmetrical power relations in design studio (Karabulut, 2020). The ritualistic practices in the design studio setting can also build up and legitimise the symbolic power and authority of the design teachers and critics that profoundly distort the pedagogic outcomes (Webster, 2007). Persuasion is the principal tone of discourse in such conceptions (Dutton, 1991), much less a tactic to be used for domination and manipulation (Freire, 1970).

To liberate education, Freire offers the “problem-posing” concept of education that “regards dialogue as ... the act of cognition which unveils reality” (Freire, 1970, p.

83). Problem-posing education breaks the vertical patterns of authoritarianism between teachers and students (Ordóñez, 1981). Attempting to balance the maldistribution of power relations between design teachers and students, dialogue democratises the studio (Dutton, 1991). The students become the critical co-investigators in the dialogue with teachers (Freire, 1970). Here, according to Freire (1970), the success of teachers is determined by their ability to establish dialogue within the framework of the principle of reciprocity, instead of persuasion (Goulet, 1973).

1.2.2.3 The pedagogical roles and approaches of design teachers

According to Lodson and Ogbeba (2020), teachers have a crucial role to play in the lives of their students from elementary to higher level of education. Thus, design teachers, supporting teaching staff and other faculty members in design education hold a serious “pedagogical responsibility” in the studio setting (Ledewitz, 1985). However, studio teachers do not usually receive any training in design pedagogy or teaching practices (Goldschmidt et al., 2010). Therefore, the pedagogical approaches of design teachers depend on what they witnessed as students during their undergraduate education and their intuition (Attoe and Mugerauer, 1991). Based on the “experience, awareness, and talent,” (Goldschmidt et al., 2010) pedagogical approaches can include specific communication styles, strategies and tools regarding a variety of modes of performances (Grasha, 1996). In communication with their students, who are also listening and imitating, most teachers prefer telling and demonstrating together in the design studio according to their own strategies (Demirbas and Demirkan, 2003). In today’s design education, the responsibility of design teachers is not described as “passing their knowledge to students,” (Gunoz and Uluoglu, 2023, p. 7) but rather as “creating and fostering learning environments” (Seidel and Shavelson, 2007, p. 455) with regard to their design approach and the views on teaching and learning (Gunoz and Uluoglu, 2023). Thus, teaching itself is considered a design activity in which the epistemic, set and social design of education can be delivered to the design students (Goodyear, 2015) as an effort to conceptualise and bring about certain changes to a positive end (Dinham, 1987).

In the design studio, teacher-student interaction based on one-on-one discussions depends on the pedagogical skills of design teachers (Goldschmidt et al., 2010), which

has a highly significant impact on the students' design and learning processes (Efilti and Gelmez, 2021; Lueth, 2008; Sachs, 1999). The pedagogical roles of design teachers "can be pre-defined by the teacher, constructed during the interaction, determined by the students, influenced by the environment, guided by the course content or instructional method" (Efilti and Gelmez, 2021, p. 262). In addition to these, the constructions of teachers' pedagogical roles are also varied and privatised regarding the personal characteristics, psychological factors, and interpersonal communication (Grasha, 1996).

The design studio teachers and supporting teaching staff can adopt distinctive roles, having different impacts on cognitive, affective, and psychomotor learning of students (see Efilti and Gelmez, 2021). The studio teacher can act as an analyst, articulator, caring helper, catalyst, choreographer, coach, entertainer, hegemonic overlord, knowledge facilitator, liminal servant, mentor, negotiator, role model, street-level bureaucrat, studio master, etc. (see Ashkan, 2016; Attoe and Mugerauer, 1991; Barrett, 2000; Demirkan, 2016; Goldschmidt et al., 2010; Mewburn, 2012; Ochsner, 2000; Oh et al., 2013; Oxman, 1999; Park, 2020; Schön, 1987; Uluoglu, 2000; Webster, 2004). To exemplify, Uluoglu (2000) addresses the role of a design studio teacher as a *studio master*, who possesses and transmits the knowledge to the students, like the *hegemonic overlord* role (see Webster, 2004) who is in a "spiritual, emotional, and intellectual emptiness" (McLaren, 1988, p. 165), or Ashkan (2016) defines a *street-level bureaucrat* role, who concentrates on the tasks and responsibilities rather than the student activities. In addition, Schön (1987, 1988) discusses this role in his seminal book as a *coach*, who demonstrates designing and describes it through reflection in order to help students to take their own responsibilities for self-education in designing, Demirkan (2016) defines the role of *knowledge facilitator*, who encourages the student engagement and guides the experiences of them. Moreover, Barrett (2000) mentions a *mentor* role of design teachers, who holds a parental attitude for students, collaboratively progresses the design critiques with the active participation of students, and Mewburn (2012) presents a *choreographer* role of design teacher, who sets up the environment and dynamics for peer-to-peer critique. Furthermore, the *liminal servant* role "aims to assist the student's construction of knowledge via critically reflective dialogue that involves both cognitive and social dimensions of learning" (Belluigi,

2016, p. 25) that can be conceptualised as “an ideal role in the realm of student-centred teaching” (Efilti and Gelmez, 2021, p. 254).

Moreover, supporting teaching staff in design including research assistants, who are usually postgraduate students, attending design studio courses together with the instructors, and the teaching assistants, who give direct pedagogical support to undergraduate programs, are also “pedagogically valuable” while interacting with learners (see Efilti and Gelmez, 2023a; Webster et al., 2011). Regarding the in-studio context, the pedagogical roles of supporting staff cover both active and passive teaching activities. While “*supplementary, adapter, gate, and role model* include reasonable activeness in design studio courses. Following these roles, it can be said that *back support, host, balancer, peer, and psychologist* roles have low-set activeness. At the bottom, “*assistant, observer, and secretary* roles are located as passive roles” (Efilti and Gelmez, 2023a, p. 1162) (see Figure 1.1).

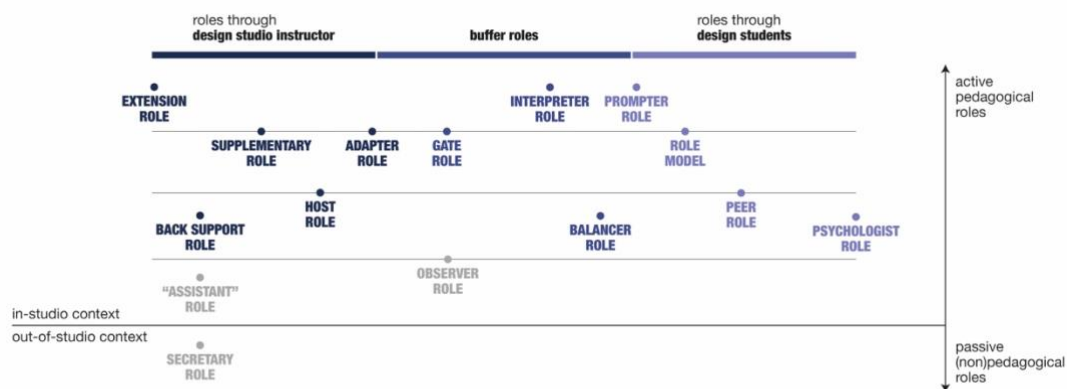


Figure 1.1 : The mapping of pedagogical and non-pedagogical roles of supporting teaching staff (Adapted from Efilti and Gelmez, 2023a).

As mentioned in the literature, almost a hundred roles are associated with different design teachers’ pedagogical approaches (see Efilti and Gelmez, 2021). These roles can be cultivated from distinctive hallmarks varied from an authoritarian, liberating to parental figure that may position closer to different educational theories, such as banking or problem-posing concept, master-apprentice model, student-centred education, etc.

1.2.3 The phenomenon of empathy

Empathy is a more complex “happening,” which is distinct from related intersubjective processes (Davis, 1990). This unique phenomenon takes place when one is deeply attached to another person by listening carefully and aligning self to another person or a group. This is an interpersonal process in which the self adopts intrinsic values and mannerisms of others (Davis, 1990). The literature has dispersed attempts to clarify this process of empathy in different ways and contexts, such as science, health, psychology, ethics, education, etc. (see Barnes and du Perez, 2015).

Alongside an attitude or a single action, the complexity of the concept of empathy is defined as a process and a skillset to be developed (López-León and Gómez-Valdez, 2018). As stated by Coşkun Keskin (2014), it incorporates the stages building upon a circular process moving from acting, meaning, imagination, perspective-taking, feeling to understanding. This multi-staged process triggers the emergence of emotional contagion, identification, and role taking (see Coşkun Keskin, 2014; Gladstein, 1983). It is an experience of being led by the foreign consciousness and takes place in modalities including perceiving and experiencing (see Stein 1989). Moreover, according to Stueber (2006), empathy proceeds in three phases as matching phase when adopting a different conative relation to the world; simulation phase when thinking about the world from that perspective; and attribution phase when interpreting the other’s action on the knowledge of what happened during the simulation phase (see Oxley, 2011). Besides, Oxley (2011) discusses “empathy as a multidimensional process involving mental events such as imitation, projection or pictorial representation, affective components, and epistemic or behavioral outputs.” It is understood that it takes place in particular overlapping stages of cognitive attempt to understand and emotional deepening followed by a strong feeling of “at-oneness” with the others (Davis, 1990).

In spite of the conceptual distinctions between social emotions and cognitive mechanisms for taking others’ perspectives at neuroscientific levels, empathy is used as an umbrella term encompassing affective and cognitive routes to understand others (Stietz et al., 2019). To empathise is defined as “feeling a congruent emotion with another person, in virtue of perceiving her emotion with some mental process such as imitation, simulation, projection, or imagination” (Oxley, 2011, p. 32). In addition to this, as a direct experiential understanding of others, it begins when the self

comprehends another's mental state through a simulative process of imagining what it is like to be in the other's situation (as cited in Zahavi, 2014). The ability to empathise is a fundamental aspect of social interaction, as it enables one to see and feel the world as the other person does through intellectually taking the role or perspective of another person and responding with the same emotion to another person's emotion (Gladstein, 1983).

1.2.3.1 Empathy in design

In the field of design, framed as the ability by which designers identify themselves with users' thoughts and feelings intuitively (see Koskinen et al., 2003), empathy refers to a "a respectful and genuine interest" (Hakio and Mattelmäki, 2023, p. 6) and aspiration to become sensitised to others (Kouprie and Sleeswijk Visser, 2009). Enabling designers to immerse in the users' lives to cultivate an empathic understanding about their latent realities (Li and Hölttä-Otto, 2022), as well as turning designers' experiences and emotions into inspiration for better design solutions (Koskinen et al., 2003; Mattelmäki et al., 2014), empathy is also methodologically translated into experimental approaches for design research and practice (see Hakio and Mattelmäki, 2023; Koskinen and Battarbee, 2003). Therefore, designers utilise a variety of methods (see Tellez Bohorquez, 2017; Thompson, 2005) to envisage what it would be like for them to be the user (Kouprie and Sleeswijk Visser, 2009).

To create user knowledge and inform the decision-making in design, varied forms of design reasoning that include implicit and explicit techniques are also used by designers (see Dorst, 2011; Oygür, 2018). Perspective-taking, as one of these techniques, is a situated way to improve interpersonal understanding by adopting a user's point of view (Surma-aho and Hölttä-Otto, 2022). Taking the distinctive perspectives in design is examined in design teams (Surma-aho et al., 2022), design processes, and collaborations (see Ryokai et al., 2022). Smeek et al. (2016) also discuss specific perspectives designers draw upon and the value of perspective transitions for design practice. Framed as the empathy skill by which designers (McDonagh, 2015), which defines the limit of "empathic horizon" (McDonagh-Philip and Denton, 1999), perspective-taking relates to the degree to which one can imagine oneself in others' shoes (Davis, 1983), which is based on sensemaking and visceral responding.

1.2.3.2 Empathy in design education

López-León and Gómez-Valdez (2018) examine whether the design studio favours empathy. In addition to the impact of empathy on design practice and process, empathy can be cultivated through design education around the signature pedagogies such as design studio environment, design project and brief, design research, design materials, as well as design conversation and crit (see Shreeve, 2015). According to Cooper (2004), one of major factors, curricula management has a significant potential for promoting the environments and paths for empathy development. Moreover, a suitable empathic learning atmosphere likely encourages the development of empathy. Empathic approach embodied for the development of design projects, based on written briefs including research methods, tools, and materials utilised throughout the design processes of students, form the learning and teaching experiences (López-León and Gómez-Valdez, 2018).

Empathic interactions within the context of design education, especially design studio setting, frame the professional identities of design students as well as the teaching approaches of teachers (see Altay, 2014; Cooper, 2004; López-León and Gómez-Valdez, 2018; Tracey and Baaki, 2022). Non-empathic experiences of students straight-forwardly shape the motivations and participation in the studio, the performances in their learning processes as well. Thus, training empathic teachers and teaching approaches are significant to promote the empathic learning environment and develop the skills of students leading them to be capable of empathic (López-León and Gómez-Valdez, 2018).

The phenomenon of empathy and its conceptualization in design education will be discussed in depth and specific to the research objectives covered by the following chapters.

1.3 Problem Statement

Despite a growing interest for the development of educational theories and the research on teaching and learning, it is well agreed that much more exploration is needed to understand the sophistication of the design education regarding the practices of design studios (Gunoz and Uluoglu, 2023).

Since a design studio is considered to be an essential part of design education, there is no fully understanding of how teaching and learning takes place (Ferreira et al., 2016). Especially, the real-context interaction between design teacher and student, holds a mystery, yet there is a shortcoming of any serious discussion about how the teacher-student interactions and conversations unfold in the field of design education research (Ferreira, 2018a; Ochsner, 2000), so needs a closer and in-depth examination (Goldschmidt, 2002; Goldschmidt et al., 2010) under the design pedagogy. In the literature, the requirement of more comprehensive analysis of the critiquing sessions, based on design conversations between teachers and students, is also defined (Goldschmidt et al., 2010).

Empathy is a kind of art that involves individuals stepping imaginatively into the others' shoes, understanding their feelings and perspectives, and using that understanding to guide their actions (Krznaric, 2014). As prosocial behaviours and interactions in the design studio setting, design conversations also hold the reactions and responses that cultivate empathic understanding. López-León and Gómez-Valdez (2018) highlight how significant empathy in design conversations based on critiquing sessions is to comprehend the aspects and viewpoint of students' works. Due to the multi-layered and complicated concept of empathy, it requires to be studied thoroughly to link and put it into practice and professional performance (López-León and Gómez-Valdez, 2018).

1.3.1 Research objectives and questions

The framework of empathy is shaped by the context itself (Wiseman, 2007). Despite the strong connection of empathy with design research and practice (Kouprie and Sleeswijk Visser, 2009; Mattelmäki et al., 2014), there is a significant research gap regarding empathy in design education (see Chapter 2 and 3).

Thus, the main research question of this thesis is:

- How can empathy be embodied in design education?

This thesis particularly focuses on this research gap within the context of both conceptual and practical objectives. Aiming to make contributions and implications regarding these frames, a conceptual framework related to the embodiment of this phenomenon in design education as well as a practical framework related to

developing sui generis pedagogical tools towards the cultivation of empathic design education and teachers are studied together.

The ambiguous nature of both design and empathy complicates the conceptualization of empathy in the context of design education. Firstly, to discover and map the multi-layered and complex phenomenon of empathy in the relevant literature (see Chapter 2), these sub-questions are examined:

- What are the dimensions of empathy in design education?
- How can these dimensions be mapped to create a conceptual framework regarding design education?

Secondly, for a deep investigation of the relations and impacts of empathy on design learning and teaching activities within the context of design education (see Chapter 3), these sub-questions are inquired:

- What are the impacts of empathy on design learning and teaching within the design education literature?
- What are the research gaps for further studies?

Centering upon the interactions between design teachers and students, the following examination aims to elicit empathy embedded in design conversations. Thus, in teachers' design studio conversations, empathic indicators, where design teachers identify themselves with another agency, are pursued (see Chapter 4) under these sub-questions:

- How do design teachers take the perspectives of other agencies in design conversations?
- What delivery styles do design teachers use during design conversations to invoke empathic perspective-taking?

Associating empathy with perspective-taking in design conversation is treated as a part of an empathic approach of design teachers. Therefore, to unveil the underlying aspects of design teachers' empathic approaches in design conversations holistically (see Chapter 5), the following sub-question are scrutinised:

- What are the motives of design teachers behind empathic perspective-taking in design conversations during design teaching?

- How can pedagogical tools be developed to explore empathic perspective-taking of design teachers through a participatory approach?

As a last step, in the light of the investigations conducted to address the above-mentioned inquiries, the conceptual implications of perspective-taking of teachers as an empathic component of design conversation as well as the practical implications of pedagogical exercises for the cultivation of empathic design education are developed and discussed (see Chapter 6).

1.4 Structure of the Thesis

This thesis consists of six chapters written in accordance with the rules and regulations established by Istanbul Technical University Graduate School for the doctoral thesis out of at least three published scientific articles (LEE, 2020). In compliance with the consideration regarding the content of the thesis, it covers the Introduction chapter, main sections of publications related to the thesis, and the Conclusion chapter (see Figure 1.2).

Chapter Organization		
	CHAPTER 1	Introduction
Scanning the horizon	CHAPTER 2	Mapping the dimensions of empathy in design education
	CHAPTER 3	Diving into the impacts of empathy on design learning and teaching
Deep diving	CHAPTER 4	Eliciting empathy embedded in design conversations
Mining together	CHAPTER 5	Digging into the empathic perspective-taking of design teachers
	CHAPTER 6	Conclusion

Figure 1.2 : Chapter organisation of the thesis.

The introductory chapter (Chapter 1) of the thesis starts with the motivation of the researcher and continues with the presentation of the concepts of the thesis. The problem statement, research objectives and questions of the study are defined, and the structure of the thesis is delivered.

Each publication that builds on each other is represented as a separate chapter throughout the thesis. Thus, the next four main chapters (from Chapter 2 to Chapter 5) representing the publications separately are prepared under three metaphorical phases going deeper into the subject gradually, such as, “scanning the horizon,” “deep diving,” and “mining together” (see Figure 1.2).

The “scanning the horizon” phase is based on a systematic understanding of the literature to explore the indirect and dispersed connections of empathy with design education (see Chapter 2) as well as the impacts of empathy on design learning and teaching (see Chapter 3). The “deep diving” phase aims to delve into the embodiment of empathy in design studio education, so is based on the interrogation of the design studio conversations between teachers and students in order to explore the indicators regarding empathy (see Chapter 4). Last phase, “mining together,” focuses on developing in-depth understanding towards empathic perspective-taking in design teaching in a participatory way (see Chapter 5) (see Figure 1.4).

The second chapter (Chapter 2. Mapping the dimensions of empathy in design education) aims to explore the dimensions of empathy within the context of design education literature systematically to create a mapping for a conceptual framework. This section starts with a brief description of how the concept of empathy has been framed in the literature throughout the years. Then, empathy and its significance in design education is emphasised. The methodological framework of this study including the objectives of the study, how the relevant literature is defined, filtered and analysed contextually are defined. Three interwoven dimensions of empathy in design education are defined and their bilateral relationship considering frequency are made in regard to the intersectional analysis on the axes of micro to macro, explicit to implicit, and individual to social. Within this context, an integrative framework developed clarifies the ambiguous nature of empathy in design education and offers research-based implications for design education researchers, pedagogical implications for design teachers, and institutional implications for decision-makers.

This chapter was published in the journal *Art, Design & Communication in Higher Education* as an original article in 2023.

In the third chapter (Chapter 3. Diving into the impacts of empathy on design learning and teaching), the impacts of empathy on learning and teaching in the relevant design education literature are systematically examined in order to address the research gaps for practice. Starting with the importance of understanding empathy in design learning and teaching, this section continues with the detailed identification of the literature. Eight themes appearing in the thematic data analysis are clarified in detail. This study also offers particular interventions in the learning process of students and the teaching approaches of teachers that are discussed both methodologically and pedagogically. This chapter was published in the *International Journal of Technology and Design Education* as an original article in 2024.

The main aim of the fourth chapter (Chapter 4. Eliciting empathy embedded in design conversations) is examining design studio conversations to reveal the empathic indicators addressed (1) how design teachers take the perspective of other agencies and (2) what deliveries are utilised for empathic perspective-taking. In accordance with this purpose, data is collected from design studio courses via participant observation studies. Following these, an ethnographic content analysis is conducted for observation field notes. This study shows that design teachers take the perspectives of both human and non-human to ensure cognitive or affective attunement regarding design practice with design students in a direct or mediated way. This chapter was published in the *International Journal of Art & Design Education* as an original article in 2024.

The fifth chapter (Chapter 5. Digging into the empathic perspective-taking of design teachers) centres upon to comprehend the underlying motives of design teachers' empathic perspective-taking. This section starts with the explanation of perspective-taking in design conversations as a part of a more holistic empathic approach in design pedagogy. In order to provoke design teachers to think about their perspective-taking during design conversations, to interpret their own motives behind this phenomenon, as well as to increase their awareness about perspective-taking and reflection on design studio practices, a pedagogical probe study is developed and conducted with the participation of design teachers and supporting teaching staff. Via a directed approach to qualitative content analysis, the underlying motives and drivers for perspective-

taking of design teachers are analysed. This method is also addressed towards new pedagogical tools in design education. This chapter is submitted to an international peer-reviewed journal as an original article that is currently in-review process.

In the concluding chapter (Chapter 6), the overview of the thesis, the discussions around conceptual and practical implications developed based on the review of findings, the limitations of the study, and the recommendations for further studies are presented.

1.4.1 Triangulation combinations of the thesis

As known, “triangulation is the combination of at least two or more theoretical perspectives, methodological approaches, data sources, investigators, or data analysis methods” (Thurmond, 2001, p. 253). Researchers can use triangulation to contribute to the understanding of the phenomenon holistically, so more than one type of combination can also be used within the same study (Thurmond, 2001).

The studies carried out within the scope of this thesis and prepared separately as articles, are based on the multiple triangulation combinations, such as methodological approaches, data sources, and data analysis procedures (see Figure 1.3).

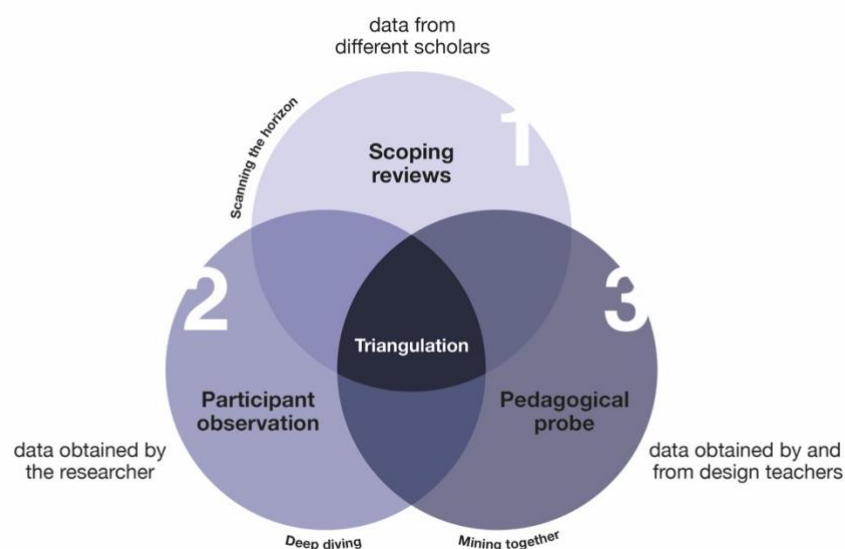


Figure 1.3 : Triangulation combinations of the thesis.

The preliminary studies (Chapter 2 and 3) are based on scoping literature review studies, which aim to map the relevant literature to understand the dimensions of

empathy in design education and to reveal the impacts of empathy on design learning and teaching. These studies allow the researcher to acquire the data represented by different scholars. The obtained data is also analysed contextually and thematically regarding the research objectives. Then, participant observation studies (Chapter 4) centre upon capturing empathic indicators embedded in design conversations, which are the empathic perspective-taking of design teachers towards different agencies and the deliveries utilised to invoke perspective-taking. This study also enables the researcher to obtain data from design studio courses directly. Ethnographic content analysis procedure is also used for the obtained data. In addition to this, the objectives of the pedagogical probe study (Chapter 5) are to enrich the data obtained from preliminary studies and delve into this research phenomena through the phenomenological perspective. Relying on the self-documentation of design teachers and supporting teaching staff participants, the motives behind empathic perspective-taking of design teachers during design conversations are explored. Thus, this study ensures to obtain data by and from design teachers that is analysed via a directed approach to content analysis.



	Chapters of Publications	Methods	Research Questions	Related Publication
Scanning the horizon	CHAPTER 2 Mapping the dimensions of empathy in design education	Scoping literature review and Content analysis	- What are the dimensions of empathy in design education? - How can these dimensions be mapped to create a conceptual framework regarding design education?	Efiliti, P., & Gelmez, K. (2023). Mapping three dimensions of empathy in design education: Educational interventions, aspects and contexts. <i>Art, Design & Communication in Higher Education</i> , 22(1), 121-148.
	CHAPTER 3 Diving into the impacts of empathy on design learning and teaching	Scoping literature review and Thematic analysis	- What are the impacts of empathy on design learning and teaching within the design education literature? - What are the research gaps for further studies?	Efiliti, P., & Gelmez, K. (2024). A deep dive into the impacts of empathy on design learning and teaching. <i>International Journal of Technology and Design Education</i> , 34(2), 809–852.
Deep diving	CHAPTER 4 Eliciting empathy embedded in design conversations	Participant observation and Ethnographic content analysis	- How do design teachers take the perspectives of other agencies in design conversations? - What delivery styles do design teachers use during design conversations to invoke empathic perspective-taking?	Efiliti, P., & Gelmez, K. (2024). Eliciting empathy embedded in design conversations: Empathic perspective-taking of design teachers towards design students, users, and materials. <i>International Journal of Art and Design Education</i> .
Mining together	CHAPTER 5 Digging into the empathic perspective-taking of design teachers	Pedagogical probe and Directed content analysis	- What are the motives of design teachers behind empathic perspective-taking in design conversations during design teaching? - How can pedagogical tools be developed to explore empathic perspective-taking of design teachers through a participatory approach?	Efiliti, P., & Gelmez, K. (in review). Let's take a new perspective!: A pedagogical probe study for digging into the empathic perspective-taking of design teachers. <i>ANONYMOUS</i> .

Figure 1.4 : Publications of the thesis.



2. MAPPING THE DIMENSIONS OF EMPATHY IN DESIGN EDUCATION¹

The complex and multi-layered phenomenon of empathy has its roots in design research and design practice, and so has indirect and dispersed connections to design education. Moreover, the ill-defined nature of design increases the complexity level while handling empathy in design education. Based on the scoping literature review, this study maps empathy in design education within three dimensions: the educational interventions, the aspects and the contexts of empathy. Qualitative content analysis is conducted to establish the categories representing the dimensions of empathy in design education. Through this integrative framework based on these three dimensions, the dispersed connections of empathy with design education are systematically examined and research gaps for future studies are discussed.

2.1 Introduction

In the 1980s, the concept of empathy was mentioned as a bilateral phenomenon that can be described as an instinctive sympathetic reactivity (affective process) and a recognizing capability (cognitive process) (Davis, 1980). This dichotomy over empathy is the most fundamental distinction that has been studied ever since. While the cognitive process includes perspectivetaking and fantasy subscales, the affective process includes empathic concern and personal distress. The perspective-taking represents the ability “to adopt the perspectives of other people and see things from their point of view” (Davis, 1980, p. 2); fantasy is “the tendency to imaginatively transpose oneself into fictional situations (e.g., books, movies, daydreams)”; empathic concern refers to “the degree to which the respondent experiences feelings of warmth, compassion and concern for the observed individual”; and personal distress is an

¹ This chapter is based on the article: Efilti, P. and Gelmez, K. (2023). Mapping three dimensions of empathy in design education: Educational interventions, aspects and contexts. *Art, Design & Communication in Higher Education*, 22(1), 121-148. [© Intellect™]

“individual’s own feelings of fear, apprehension and discomfort at witnessing the negative experiences of others” (Davis, 1980, pp. 11–12).

Then in the 1990s, empathy was distinguished into two types: basic empathy, which is innate, and trained empathy, which is deliberate and learned, that is, a skill (see Alligood, 1991; Morse et al., 1992). Thus, Sutherland termed empathy as “a personality trait, an ability, an attitude, a feeling, an interpersonal process, a sensitivity, and a perceptiveness” (1993, p. 369). The phenomenon of empathy was defined by Morse et al. (1992) as an incident identifying how a person acts in four dimensions as moral, emotive, cognitive and behavioural. Moreover, Raudonis (1993) considered empathy as a relationship and discussed the outcomes and positive effects of empathic relations. O’Hara (1997, p. 26) argued that relational empathy needs to be understood as an essential concept of “human relational connectedness.” It requires a skilful activity that is the expansion of one’s consciousness by including the other.

With the new century, the concept of empathy has become more and more layered and has been discussed in terms of intersubjectivity and instrumentality. For instance, Finlay (2005 p. 272) proposed three layers of empathy, such as “connecting-of the other’s embodiment to our own,” “acting-into the other’s bodily experience” and “merging-with the other’s bodily experience,” which coexist through intersubjectivity. Also, for Thompson (2005, p. 262), empathy is an “important aspect of the intersubjectivity of human experience” including inseparable typologies of “imaginary transposition of oneself to the place of the other” (2005, p. 265), “dynamic coupling or pairing of the living bodies,” “interpretation of the others as other to me” and “ethical and moral perception” (2005, p. 264). Based on Husserl’s mental directedness, empathy was defined as an “intentional capacity,” “intentional act” and “intentional process” (as cited in Thompson, 2005, p. 263). Another view also showed its unique and irreducible intentional experience of foreign consciousness (see Stein, 1989; Tellez Bohorquez, 2017). Furthermore, empathy is “a kind of act of perceiving sui generis” having three modalities as “the emergence of the experience; the fulfilling explication; the comprehensive objectification of the explained experience” (Stein, 1989, p. 10–11). With this combination, one can experience the other as a unified whole through empathy (see Finlay, 2005). Moreover, according to Markham (2016, n.p.), “empathy is more than a simple connector; it’s the subterranean, fundamental glue that holds humanity together.” Thus, it can be said that empathy promotes

prosocial behaviours by fostering healthy interactions and civic engagement (Tellez Bohorquez, 2017).

In the education field, empathy is a concept that can be teachable and learnable, whose role in education has aroused curiosity in recent years. The empathy that powers up the mind, body and spirit is located at the base of the learning pyramid (Markham, 2016). Twenty-first-century education requires people to learn life skills driven by pluriversal issues in order to cope with the challenges of daily life. At the core of this skillset, self-awareness and empathy take place to be discussed within critical pedagogies (see Noel, 2020; WHO, 2020). By reimagining the future of design education, these skills promote the well-being of learners, higher engagement in the learning process and living independently and productively within society (see Noel, 2020; WHO, 2020). Nussbaum (2010) approaches education from the perspective of human development to attain a more inclusive type of citizenship and democracy, instead of education for profit-making focusing on basic marketable skills. Herein, the lack of empathy, which is the crucial ingredient of morality, leads to marginalization and stigmatization in education. However, a good education struggles with such stereotypes through nourishing and extending the capacity for empathy (Nussbaum, 2012).

Empathy in education is also discussed under various approaches such as critical, feminist and anti-racist pedagogy (see Hemmings, 2012; Pedwell, 2012; Zembylas, 2018). Relying on the “banking” concept of education within a colonial context, according to Freire (1970), authoritative knowledge is in a superior position over other forms of knowledge and creates oppressive conditions for learners. However, these power structures in education and society may instigate transformative social actions, freedom and resistance for emancipation through empathy (see Freire, 1970; van Amstel and Gonzatto, 2020; Webster, 2006). Against the oppressive hierarchies of power, empathy can encourage the process of radical self and social transformation to wider social action and change (see Hemmings, 2012; Pedwell, 2012; Zembylas, 2018). Thus, it can be a tool for achieving cross-cultural and transnational social justice (Pedwell, 2012). In this sense, decolonizing pedagogy of empathy can be inspired through the reinventing of critical pedagogy by including “empathetic experiences of the feelings, thoughts, and situations of others” (Zembylas, 2018, p. 405). However, instead of reinforcing the othering of people, empathy also challenges “the opposition

between feeling and knowing,” in a word, “self and other,” from the perspective of feminist epistemology (Hemmings, 2012, p. 151). Thus, empathy can be a critical element through establishing imaginative reconstruction that takes the subjects to recognize their own social privilege and complicity within hierarchies of power (see Pedwell, 2012; Zembylas, 2018).

2.2 Empathy and Its Significance in Design Education

Empathy has become an essential aspect of design research, practice and education (Heylighen and Dong, 2019; López-León and Gómez-Valdez, 2018). By giving social importance, design research has seen a significant surge in the discussion of empathy (Alzayed et al., 2021) related to human-centred design, user-centred design, people-centred innovation, empathic design, universal design, participatory design, co-design and design thinking (Tellez Bohorquez, 2017). Under these approaches, empathy comes with compassion and caring (Altay and Porter, 2021) with ethical and moral considerations (Barnes and Du Preez, 2015) that represent a way to connect with others. Zingoni (2019, p. 360) noted that understanding the “silent language” is a key aspect for empathy development. By understanding users’ realities deeply, designers uncover insights while designing products, services, environments, systems and experiences that directly respond to emotions, behaviours and interactions of people (see Koskinen et al., 2003).

As widely known in the design community, the empathic understanding of the user enables designers to see the world from the eyes of the user (Koskinen and Battarbee, 2003). In design research and practice, empathy is translated into a set of tools that turn experiences and emotions into inspiration (Koskinen et al., 2003; Mattelmäki et al., 2014). Therefore, empathy cultivates the designers’ understanding and inspiration by enriching data collection beyond traditional methods (Wiebe and Seaton, 2021).

The phenomenon of empathy is also deeply connected to the different phases of the design process (Tellez Bohorquez, 2017). In the design process, design thinking primarily intertwines with the cognitive and emotional aspects of empathy, in which the former is understanding the users’ needs, whereas the latter is feeling about their experiences (Gasparini, 2015). The lack of empathy development in the fuzzy-front-end phases of the design process may cause “a mismatch between the final design and the requirements of the end-user” (Alzayed et al., 2021 p. 112301-1). In the same way,

we can assert that if empathy is not established in an educational context, a mismatch can occur between the intended learning outcomes set by design teachers and the needs of the learners.

Empathy is also one of the core components of social and emotional learning. It offers a fundamental skill for designers (see López-León and Gómez-Valdez, 2018; Şenyiğit and Yılmaz, 2020) to cope with the “wicked” and complex problems in the twenty-first century (Norman and Stappers, 2015). This skill involves disposition, perception, comprehension and communication (see Morse et al., 1992; Wiseman, 2007). Wiseman (2007) conceptualizes empathy that can be developed professionally as a skill along the continuum influenced through socialization, where different points represent different stages, respectively, as an incident, as a way of knowing, as a process and as a way of being. Tellez Bohorquez (2017) also considers empathy as an instrument for resolving interpersonal differences, an ability associated with positive social behaviours, a skill fostering collaboration and social relations, a trait of emotional intelligence and so on.

Regarding teaching activities, perceiving diverse situations and developing a comprehensive attitude towards learners’ needs can refer to being empathic (Cooper, 2004). In the context of design education, the asymmetrical construction of power in a design studio environment that legitimizes the symbolic power and authority over learners is mentioned (Webster, 2006). Nonetheless, learners’ constructive interactions with teachers and peers created through empathy embody affective learning (Cooper, 2004). Thus, to heal social illnesses and achieve social justice, empathy can be an important component for teachers to promote student engagement in learning (see Bullough, 2019). Especially, to balance the power relations between design teachers and learners, as a connective tissue, empathy can improve teaching effectiveness aiming to enact a responsive teaching practice. This can be achieved through appropriate empathic social interaction, learning styles and communication patterns by binding with their realities (Warren, 2014).

Empathic relationships in design studio courses promote an active and critical engagement of design students in their learning processes, and thus, empathy leads to preventing their alienation. Besides, empathy as an effective tool allows design teachers to identify themselves with the student to comprehend and meet their educational needs (see Cooper, 2002) in design. In this way, design teachers can

develop more purposeful learning activities or redesign the curriculum by focusing on the values of empathy (Jatin, 2021). As design education should encourage students “to address current and challenging issues concerning the environment, economics and social responsibility” (Melsop et al., 2010, p. 5), and so have a crucial accountability to respond to that. Moreover, design teachers can improve their own pedagogical approaches and roles within this context.

Nonetheless, the newness of this concept in education may cause the deficiency of related educational frameworks (see Mitchell and Light, 2018). Therefore, this study aims to systematically examine how this phenomenon is addressed in design education and create a conceptual framework by uncovering the hidden dimensions of empathy in the relevant literature.

2.3 Methodological Framework

In the field of design, empathy is often addressed in design research and practice but has also become an essential aspect of design education. However, the ambiguous nature of both design and empathy makes it even more intricate to conceptualize empathy within the context of design education. This invites us to conduct this study in order to present a conceptual framework, which maps the dimensions of empathy in design education.

The objectives of this study are to examine the relevant literature intersecting design education and the concept of empathy, to discover and map the dimensions of empathy in design education, to generate a conceptual framework through these dimensions and to discuss the research gaps and potential implications for further studies.

This current study is an initial analysis phase of an ongoing research project focusing on empathy in design education (see Efilti and Gelmez, 2024a). A scoping literature review, which is a technique to “map” the field of interest, is adopted as a research method amongst many that can be used to review literature. Depending on the purpose, this study can be a useful way to provide in-depth coverage of the literature “where an area is complex or has not been reviewed comprehensively before” (Mays et al., 2001, p. 194). A scoping review aims to identify and describe the relevant literature through particular stages of identifying the research objective, addressing relevant studies, selecting studies via particular inclusion criteria, charting the data and collating,

summarizing and reporting the results (Arksey and O'Malley, 2005). Thus, this type of review offers a depiction of the research field, a dissemination of research findings in the particular field of enquiry and an identification of the research gaps in the existing literature (Arksey and O'Malley, 2005; Mays et al., 2001).

To map the literature, a search query consisting of the terms “empathy” OR “empathic” AND “design education,” OR “design studio,” OR “design pedagogy” was formulated in order to identify studies intersecting design education and the concept of empathy. Through this query, we systematically skimmed four databases (Google Scholar, Web of Science, ScienceDirect and Scopus). Following the systematic skimming, we acquired 209 potential studies in English. Initially, the duplicate and non-access sources (n = 82) were excluded, and then the studies including the sources without full-text articles, whole conference proceedings, book chapters, book forewords, reports and dissertations (n = 25) were excluded from the review. After this process, 102 sources consisting of journal and conference articles remained for detailed analysis (see Efilti and Gelmez, 2024a).

Then, certain filterings were applied considering relevancy with design education and empathy. The articles were filtered if they had no relation with design education, studio or pedagogy within art, design, architecture and engineering education; or had no relation with higher education, citizen education or adult learning. The articles were also filtered if any keyword related to empathy was not used throughout the text; the keywords related to empathy were only used in reference lists or when citing others. After this skimming, 60 articles (see Appendix A) were included for review as a dataset (see Efilti and Gelmez, 2024a).

2.4 The Dimensions of Empathy in Design Education

In this study, qualitative content analysis, which is a systematic method to describe the meaning of qualitative material through classifying the material to build the categories of a coding frame, was conducted (Schreier, 2013). In the process of classification, the data is reduced through limiting the analysis to relevant aspects of the material. By reducing, the categories construct more general concepts that produce new information (Schreier, 2013).

In this study, the coding frame was developed through data-driven strategies, which include codes, subcategories and categories derived from the material. Coding with an iterative procedure is adaptable so as to fit the relevant material. As a conceptual device, it is a way of questioning the data for opening up new meanings. It is not purely descriptive, but relates the data to the concepts and requires the interpretation of material to a certain extent (Coffey and Atkinson, 1996; Schreier, 2013).

In the analysis phase, the first author repeatedly read all the articles, focusing on empathy in relation to design education, to achieve immersion. Instead of concept-driven categories, identifying the patterns that create the relationship between design education and empathy in the dataset is the initial part. Constant and iterative readings led to the identification of three main categories derived from the data. These categories were interpreted as the dimensions of empathy in design education that constituted our coding frame for the dataset.

It was understood that the first category/dimension describing the relationship between design education and empathy was the educational interventions applied or discussed in the articles. Educational interventions having significant connections with empathy are the implementations with special attention to the learning and teaching activities. Based on the dataset, educational interventions include six subcategories such as a singular activity, an integration in studio/course, project, course or curricula development, and citizenship education development. By considering their impacts, these are grouped at three different levels, such as micro, meso and macro.

This examination revealed that the phenomenon of empathy was materialized with specific educational purposes that represent the aspects of empathy. It was understood that the aspects of empathy were addressed differently as means, competence, scale, strategy and identity in the articles. These five subcategories move from the explicit to implicit side in regard to their visibility on learning/teaching. While the means aspect includes second-level subcategories of empathic experience and empathic tool, the competence aspect includes design skills, design approach and design collaboration. Moreover, the scale aspect represents the empathy trait, strategy refers to empathic teaching, and identity is associated with the empathic designer.

Lastly, the articles addressed distinctive contexts in which learning takes place, induced by empathy. Five contexts were specified as self-evaluation, spatial, in studio,

out of studio and societal context. These subcategories can be respectively arranged in order from the individual to the social level regarding where learning occurs. While in-studio context covers two second-level subcategories as learner-teacher and learner-peer/group interactions, out-of-studio context covers five second-level subcategories as learner-user, learner-client, learner-customer, learner-stakeholder and learner-community interactions. Furthermore, self-evaluation context refers to learners' empathy trait change, spatial context is correlated with the environmental interactions to develop empathy, and societal context represents the interactions of learners within the society.

According to the coding frame, the subcategories of each intervention, aspect and context as a unit of its dimension were separately coded in the articles (see Figure 2.1). Herein, determining the contents representing these units was carried out. To exemplify, if an article mentioned the implementation of an exercise for the development of empathy, this article was coded with "empathic experience" subcategory/unit under the "means" aspect. There is no definition as empathic experience or means on its own in this article, but here "exercise" refers to the empathic experience subcategory located under the means aspect. If an article discussed the change of design attitudes of learners in an empathic way, this article was coded with "design approach" subcategory under the "competence" aspect. If an article addressed the empathic interaction between student and teacher in a design studio course, this was matched with "learner-teacher interaction" within "in-studio context." Therefore, this coding process required immersion in the articles.

Meaningful associations were also found between these dimensions. Each unit in different dimensions was coded within an article to represent a relationship. To exemplify, the article entitled "Educational model for improved empathy: 'The pleasurable mask experience'" (Vaes et al., 2011) was coded with "design project development" as an educational intervention, with "empathic experience" as a means aspect, "design skill" and "design approach" as a competence aspect, and with 'learner-user interaction' as an out-of-studio context. Herein, design project development had one relationship with the aspect of means, but two relations with the competence aspect, and one relation with out-of-studio context (Figure 2.1). The frequency of these units associated with each other and the distribution of dimensions was also mapped in the following sections.

Authors	Title	Year	Educational interventions	The aspects of empathy	The contexts of empathy
Altay, B., Ballice, G., Bengisu, E., Alkan-Korkmaz, S., & Paykoç, E.	Embracing student experience in inclusive design education through learner-centred instruction	2016	integrations in design studio/course	means: empathic experience competence: design skill competence: design approach strategy	out-of-studio context: learner-user interaction spatial context: learner-environment interaction
Lopez-Leon, R. & Valdez, G.G.	Understanding empathy in design education	2018	course development	competence: design skill strategy identity	in-studio context: learner-teacher interaction
Vaes, K., Corremans, J., & Moons, I.	Educational model for improved empathy "the pleasurable mask experience"	2011	design project development	means: empathic experience competence: design skill competence: design approach	out-of-studio context: learner-user interaction

Figure 2.1 : An example of coding.

2.4.1 The educational interventions

We skimmed the articles in terms of their educational interventions by looking at what kind of educational activity was being applied or mentioned. Various educational activities were addressed in the dataset, such as workshops, toolkits, experiments, assignments, challenges, lectures, projects and so on (see Figure 2.2). We clustered them as singular activities, integrations in the studio/course, design projects, course or curricula development and citizenship education development.

The educational interventions also refer to these learning and teaching activities at different levels, such as micro, meso and macro. The micro level refers to small-scale interventions, the meso level represents partial educational developments, and the macro level aims for a large-scale impact or change in education.

It can be said that articles focusing on singular activities generally taking place out of studio, such as projects and workshops, are micro-level activities. In a similar manner, the integration of methods, activities, tools and so on in design education can be relatively considered as micro-level interventions. However, the development of the design project (i.e., cultivation of a theme, unit, etc.), the development of the course (i.e., cultivation of a studio, lecture, etc.) or the development of the curricula (i.e.,

cultivation of studiobased learning strategies in the curriculum) correspond to meso-level interventions, which take more effort and have a considerable impact on learning and teaching activities. Moreover, the development of citizenship education requires longitudinal and macro-level pedagogical goals and strategies regarding design (Figure 2.2).

	Educational interventions	Related learning/teaching activities
micro ↓ macro	singular activities	<i>project, workshop</i>
	integrations in the studio/course	<i>activity, exercise, framework, philosophy, design strategies, workshop, toolkit, tool, (experiential) methods, mindfulness and contemplative practices, course interventions, in-studio experiments</i>
	design project development	<i>theme, unit, assignment, workshop</i>
	course development	<i>studio, project, lecture</i>
	curricula development	<i>strategy, challenges, opportunities, studio-based learning strategies</i>
	citizenship education development	<i>pedagogical goal, faculty projects, strategy, international education, global education, educational provocation, educational projects, social projects</i>

Figure 2.2 : Educational interventions.

When we look at the distributions of interventions (Figure 2.3) in the dataset (n = 60), we can see that these interventions, which will enable learners to provide empathic understanding or development directly or indirectly, were mostly carried out as design project development (n = 23) and integrations in the studio/course (n = 21). Then, course development (n = 7), citizenship education development (n = 4) and singular activities (n = 3) were addressed. A few articles focused on curricula development (n = 2).

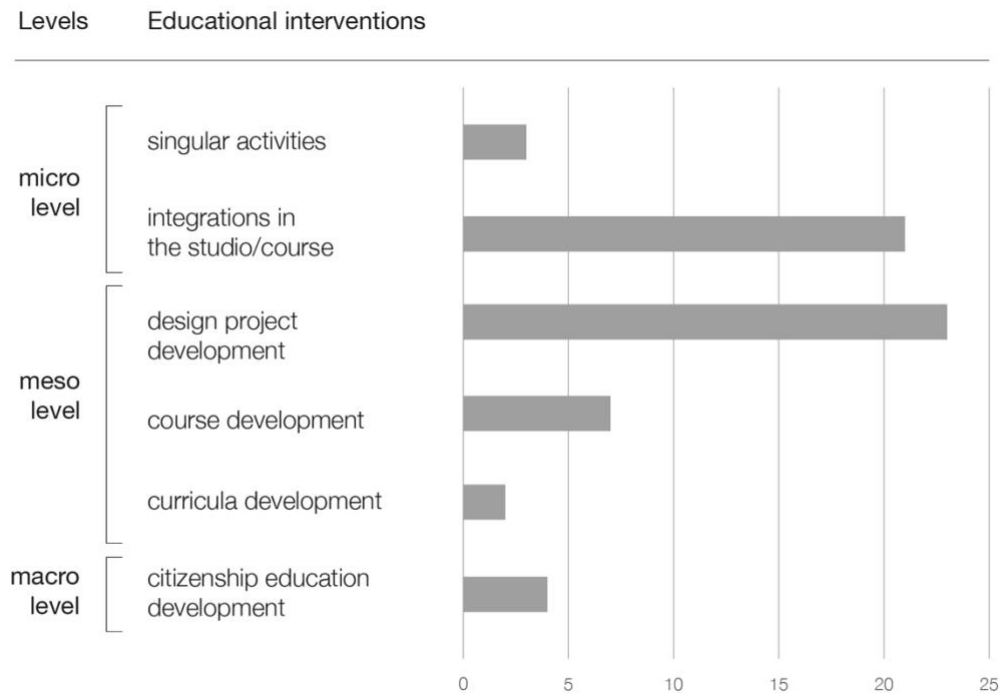


Figure 2.3 : Distribution of educational interventions.

2.4.2 The aspects of empathy

Regarding the aspects of empathy, we examined how and for what purposes empathy was addressed in the articles. From explicit to implicit levels, empathy was addressed as:

- a *means* that allows understanding others via experiences or tools, in other words, assists learners to develop empathy by proxy;
- a *competence* that refers to the skill and knowledge-based potential of learners to carry out a specific task and can be measured as learning outcomes (McConnell, 2001). In this study, the competence aspect highly embedded in design practice consists of subunits of design skill, design approach and design collaboration that can be developed within the education context;
- a *scale* that measures personal trait changes;
- a *strategy* that adopts empathy as a primary teaching approach and triggers the means, competences and identities;
- an *identity* that closely correlates with the construction of empathic behaviours and also promotes professional development as an empathic designer.

Herein, the instrumentalization of empathy as a means takes place at a more explicit level like the competence aspect, but the aspects of scale, strategy and the construction of empathic identities are at a more implicit level. While there are more tangible implementations or learning outcomes on the explicit side, deeper effects and changes can be mentioned on the implicit side.

In 56 out of 60 articles, the concept of empathy was mostly coded as a competence 85 times according to the contents of the articles, such as the improvement of empathic muscle in design activity, extension of the empathic horizon and the intelligence of learners regarding design, encouragement of empathic behaviours of learners in groups and so on (Figure 2.4). This aspect includes design skill (n = 30), approach (n = 38) and collaboration (n = 17). In 45 articles, the concept of empathy was embraced as a means including empathic experiences (n = 26) and empathic tools (n = 24). Nineteen articles were associated with empathic teaching strategies; ten of them included empathic identity construction; and six of them were related to the change of empathy as a scale (Figure 2.4). This distribution shows that the design approach under the competence aspect was related to empathy at the very most. Following this, the design skill, empathic experiences and tools were frequently related to empathy.

Aspects of empathy		Related keywords
means	empathic experience	<i>empathic ... exercise, activity, simulation, modelling, sensory and bodily experiences, empathic methods, practices</i>
	empathic tool	<i>empathic ... tool, toolkit, map, mapping, framework, research methods, design research strategy, design methods, workshop, experiment, technique, dialogue, thinking strategies</i>
competence	design skill	<i>empathic ... skillset, skill, capability, capacity, competency, strategy, aptitude, potential, muscle, design ability, design tool, disposition, design practice, design process, design method, toolkit</i>
	design approach	<i>empathic ... understanding, knowledge, mindset, approach, attitude, awareness, consciousness, intelligence, perception, perspective, worldview, mindfulness, horizon, research approach, design practice, design process, design method, insight, response</i>
	design collaboration	<i>empathic ... interaction, collaboration, dialogue, involvement, practice, behavior, enactment, communication, connection, engagement, disposition, empowerment, sensitivity, (interpersonal) relationship</i>
scale	empathy trait	<i>empathic ... tendency, scale, development, measurement, self-efficacy, perception change in students' empathy traits, measurement of trait subscales, value, change, score</i>
strategy	empathic teaching	<i>empathic ... atmosphere, environment, practice, instruction strategies, research methods, pedagogy, approach, experience, relationship, moments, pedagogical trigger, educational dynamic, engagement</i>
identity	empathic designer	<i>responsibility, willingness, ethical, compassionate, transformation, professional performance, professional practice, morality, a way of being, empathic citizen, empathic career, individual consciousness, civilisation</i>

Figure 2.4 : The aspects of empathy.

When we look at the relationships among these aspects (Figure 2.5), means integrated into design studios/courses through teaching strategies or used in an out-of-studio context may have an effect on the empathy scale, so it may cause a change in the empathy trait of learners. Besides, means can lead to the improvement of particular competences of learners like the development of competences through teaching strategies. In the long term, the strategies that are developed by design teachers affect the identity formation of learners. Moreover, the design skill, approach and/or collaboration help in identity construction of the learner not only as an empathic designer but also as a citizen.

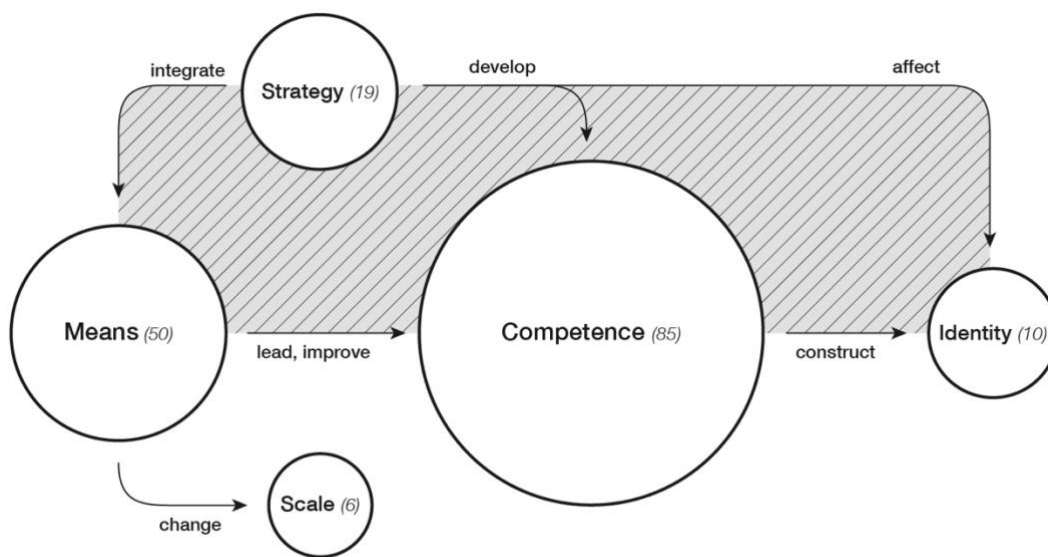


Figure 2.5 : Distributions and relationships of the aspects to each other.

2.4.3 The contexts of empathy

Throughout the articles, we also scanned the contexts in which empathy served the design learning processes. Herein, five different contexts were determined, such as self-evaluation context, spatial context, in-studio context, out-of-studio context and societal context, sequentially from individual to social level (Figure 2.6). While the individual level aims to cover more personal changes, we can see that the contexts of interpersonal interactions that take place are becoming overarching as we close to the social level.

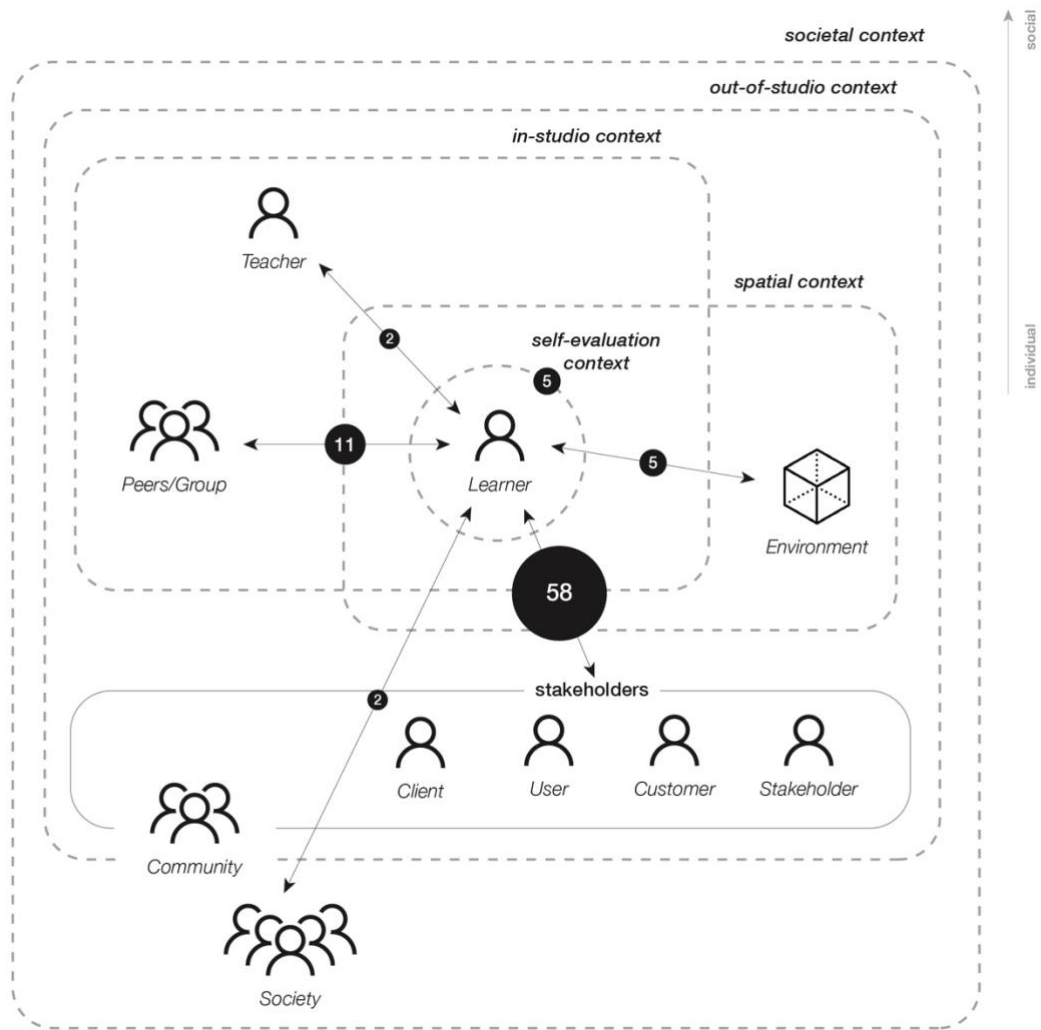


Figure 2.6 : The contexts in which empathy served learning and their distributions.

Self-evaluation context ($n = 5$) refers to the learners' evaluation of their own perception change regarding empathy through pre- and post-assessments after an educational activity. Spatial context signifies emphatical awareness and sensory consciousness emerging through the interaction of the learner with the environment ($n = 5$). For instance, some articles mention that learners experience their daily lives playing the roles of the older people or disabled people in order to develop a kind of empathy towards environments and products. In-studio context refers to empathic learner-teacher ($n = 2$) and peer/group ($n = 11$) interactions that emerged or developed in a design studio environment. Out-of-studio context, in this current study, refers to interacting with other parties in a learning process. In an out-of-studio context, students are expected to get in touch, study and collaborate with others, such as stakeholders, users, customers, clients or communities. Therefore, if an article addressed the learners' interaction with/in a particular community in an empathic way, where

learning occurs in an out-of-studio environment, this was coded with ‘learner-community interaction’ within ‘out-of-studio context’. The user ($n = 43$), stakeholder ($n = 2$), client ($n = 2$), customer ($n = 2$) and community interactions ($n = 9$) represent the learners’ empathy development towards the people the learners design for/with. Finally, empathic relationships that learners establish as empathetic citizens ($n = 2$) are represented in the societal context.

We can see that the relationship of empathy with design education is remarkably located in the out-of-studio context that focuses on improving interpersonal interactions and understanding of stakeholders. It may be an expected outcome that empathy nurtures the fields of design research and user experiences and vice versa, and also spreads to the field of design education from out-of-studio and supports learning most in this context. Moreover, empathy is an important requirement for learning in studio context, especially during in-group interactions.

2.5 Mapping the Dimensions of Empathy in Design Education

In this current study, we attempt to map the relationships among the educational interventions, aspects and contexts of empathy. This helps us to develop an integrative framework of empathy in design education into three dimensions: interventions, aspects and contexts.

The relationships of these three dimensions are bilaterally discussed as the relationship between educational interventions and the aspects of empathy, the relationship between educational interventions and the contexts of empathy, and the relationship between the aspects and contexts of empathy. Each bilateral relationship is based on the intersection of the two particular axes relative to each other: micro to macro and explicit to implicit; micro to macro and individual to social; and explicit to implicit and individual to social.

These maps show us the frequency of a unit for every two intersecting dimensions. If a relationship is established, the intersections of units correspond to a circle whose size changes to represent the number of relations established between the units. If there is no relation established, there is no circle at that intersection. With these visualizations, we can easily see the relationship that represents the contribution area of the dataset.

In each map, the units in the columns will be analysed first and then a horizontal analysis will be made of those in the rows. However, we will describe the prominent units in the columns and rows, and, more importantly, we will make an intersectional analysis and discuss the relationships. By looking at the densities of the dimensions, we aim to address the research gaps for empathy in design education to contribute primarily to design education researchers, design teachers and institutional decision-makers.

2.5.1 Relationship between the educational interventions and the aspects of empathy

When we look at the relationship between educational interventions and the aspects of empathy, we can see that they are located at the intersection of the micro-macro and explicit-implicit axes.

In Figure 2.7, it is shown that the competence aspect is frequently discussed at the micro, meso and macro levels. The means, which is the second most addressed aspect, is also related to micro and meso levels. Besides, a horizontal analysis shows that the design project development activities are related to all aspects of empathy at the utmost. The integrations in the studio/course are also related to all aspects of empathy in the second place.

The intersectional analysis shows that the relationship between the integrations in the studio/course and competences is mostly established. Following that, design project developments are frequently related to the competences and means. This distribution shows that the relevant literature is densely concentrated at the intersection of micro/meso and explicit axes (Figure 2.7).

The apparent alignment on the competence aspect shows us that the usage of empathy in design education has a crucial contribution to the development of design skills, approaches and collaborations. It reveals that empathy is based on design practice and, thus, shapes competences around this practice. This high relevance of empathy with the design competences may also be a requirement of a course outcome or a crucial purpose of practice-based education as a pedagogical goal. It can be said that empathy is integrated into design studios/ courses via practices, toolkits, experiments and so on, or embedded in design projects to nurture the design competences of learners. In

addition, the substantial alignment on the means aspect demonstrates the experiential feature and the explicitness of empathy at its intersection with design education.

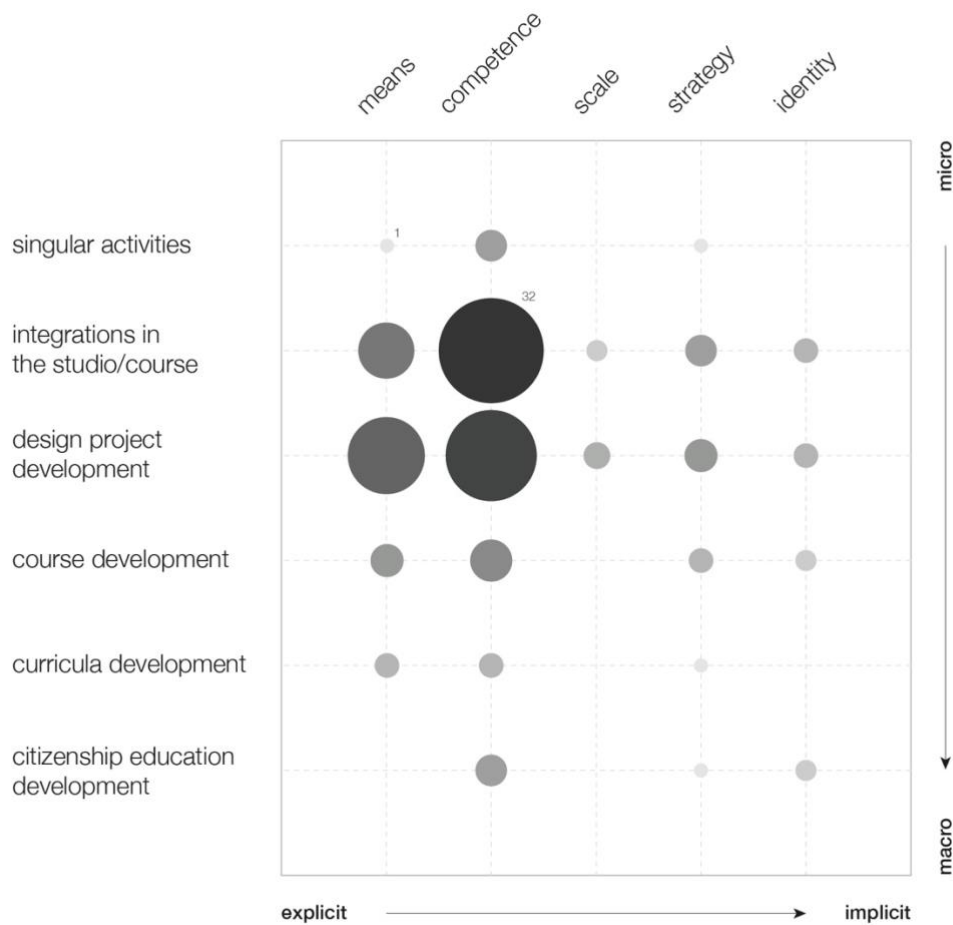


Figure 2.7 : Map of the relationships between educational interventions and the aspects from micro to macro and explicit to implicit (see Appendix B).

2.5.2 Relationship between educational interventions and the contexts of empathy

When educational interventions and the contexts of empathy are examined together, it is seen that micro-macro and individual-social axes intersect.

Figure 2.8 shows that out-of-studio context, including all stakeholder interactions, is related to micro, meso and macro levels. Besides, the in-studio context involving both teacher and peer interactions of learners is related to all levels of educational activities. According to a horizontal analysis, both integrations in the studio/course and the design project developments are related to all the contexts of empathy, except the societal context.

Since empathy has its particular roots in user research, we can see that the density aligns with the out-of-studio context covering interactions with users, stakeholders, clients, customers and the community. At this point, it can be said that learning arises from social interactions, and empathy supports these interpersonal interactions and encourages learning interventions. The intersection of micro-macro and individual-social axes shows that the relationship between the design project development at the meso level and the out-of-studio context closer to the social side is mostly established. Similarly, the integrations in the studio/course at the micro level and the out-of-studio context also have a remarkable relationship. Examining the relationship between educational interventions and the contexts of empathy shows us that the distribution of relevant literature is mostly concentrated at the intersection of micro/meso and social axes (Figure 2.8).

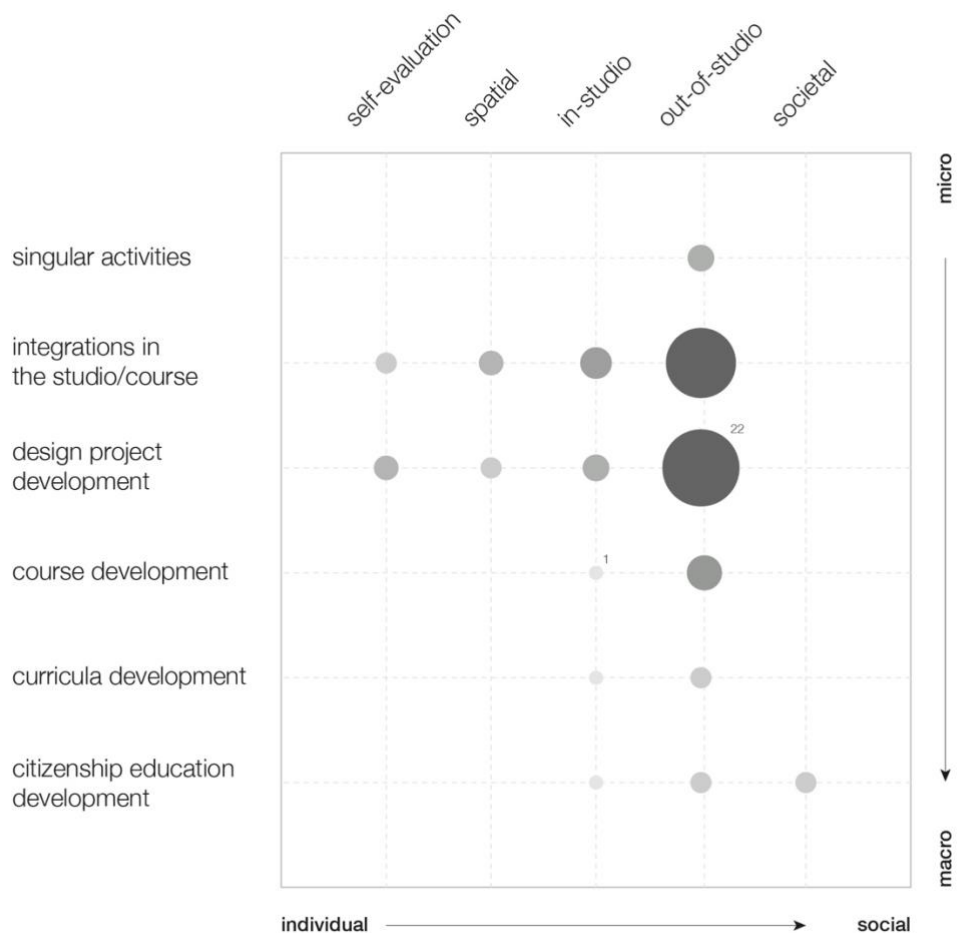


Figure 2.8 : Map of the relationships between educational interventions and the contexts from micro to macro and individual to social (see Appendix C).

2.5.3 Relationship between the aspects and contexts of empathy

The relationship between the aspects and contexts of empathy intersects the explicit-implicit and individual-social axes.

Figure 2.9 shows that the competence aspect of empathy is mostly related to all of the contexts. Then, the means aspect is addressed in different contexts, such as self-evaluation, spatial, in studio and out of studio. Horizontally, we can also see the highest number of relations established between the out-ofstudio context with all aspects of empathy. In-studio context is related to all aspects, and the self-evaluation context that has relations with more explicit aspects of means, competence and scale follows it.

When we examine the intersection of the aspects and contexts of empathy, we see that the greatest number of relationships are established between the aspect of competence and the out-of-studio context. Following that, the aspect of means that is related to the out-of-studio context is frequently addressed. It reveals that the distribution of the dataset is concentrated at the intersection of explicit and social sides (Figure 2.9).

Here again, the strong correlation of empathy with user research leads to the improvement of design competences through interpersonal interactions. Therefore, there is a remarkable alignment in the out-of-studio context. In this alignment, we also see that the out-of-studio context and interpersonal interactions have an important part in empathic teaching strategies. On the other hand, we think that the less-concentrated alignment in the design studio context compared to out-of-studio, which relates empathy with the teacher and peer/group interactions of learners, has a significant potential for future studies to focus on. Another concentration on the competence and means aspects also emphasizes the feature of empathy, which is being experienceable and developable in design education.

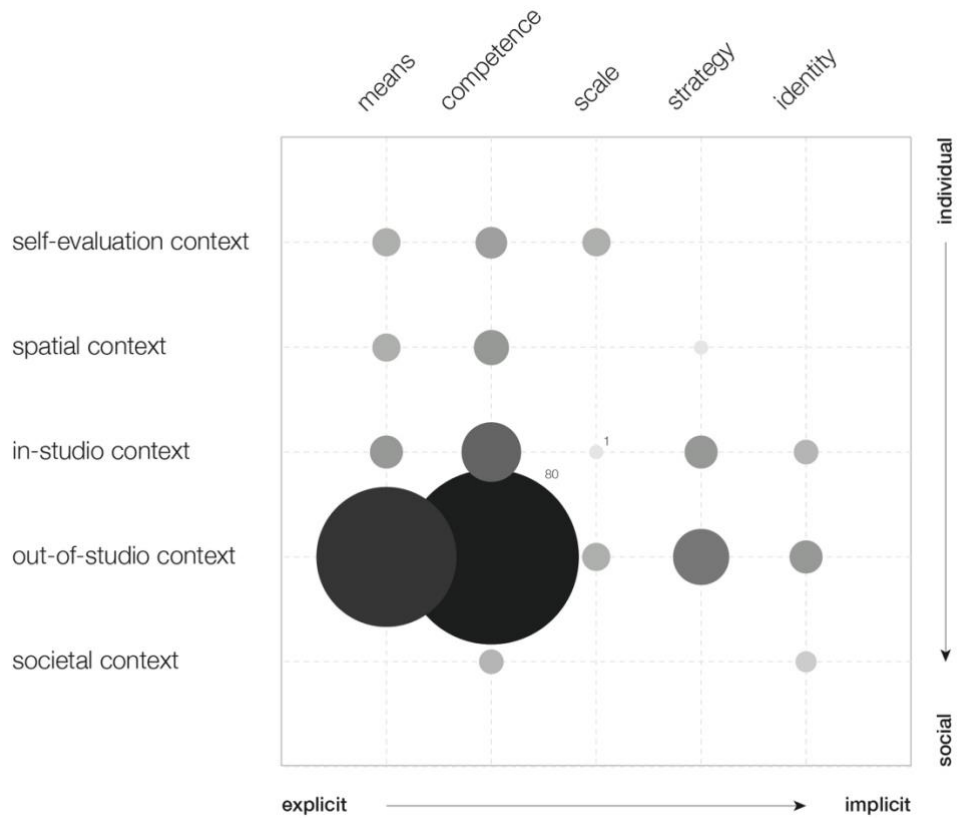


Figure 2.9 : Map of the relationships between the aspects and contexts of empathy from explicit to implicit and individual to social (see Appendix D).

2.6 Implications from the Framework of Empathy in Design Education

Via a deep and iterative review of the articles, the educational interventions, the aspects and contexts of empathy are revealed as the dimensions of empathy in design education. In fact, these three dimensions are interwoven, affecting and forming each other, and so constitute the integrative framework of empathy in the relevant literature.

It is shown that the relevant literature mostly contributed to the intersection of micro/meso, explicit and social axes via the shaded area (Figure 2.10). The micro/meso level includes the educational interventions of integrations in the studio/course and design project developments; the explicit axis refers to the competence aspect mostly; and the social axis implicates out-of-studio context.

The framework proposed in this study clarifies the ambiguous nature of empathy in design education and leads us to identify research gaps and open discussion for future studies. We believe that this study offers three implications: research-based

implications for design education researchers, pedagogical implications for design teachers and institutional implications for decision-makers.

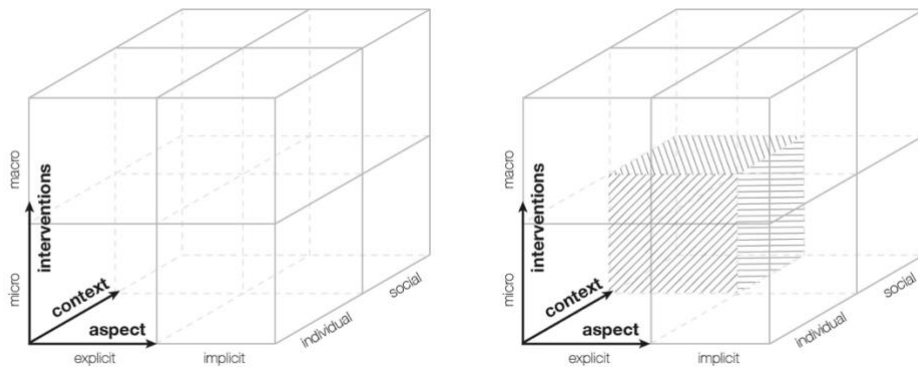


Figure 2.10 : (a) An integrative framework of empathy in design education. (b) The area most contributions were made in the relevant literature.

2.6.1 Research-based implications for design education researchers

It has been understood that the development of micro-level educational interventions and their empathic outcomes are nurtured at the points where the research is put into practice. Design education researchers can focus on improving empathic tools that support educational interventions and can be integrated into design education. They may discuss how empathic awareness is changed through these tools or conduct fieldwork to accomplish empathic interpersonal interactions.

The visualizations proposed in this study simplify the findings and enable the researchers to see the research gaps for further studies. Figure 8 illustrates the limited relationships in citizenship education development, representing a research potential for scholars. In addition, the framework shows that different axis intersections outside the shaded area are open to examination. While some axis intersections may remain irrelevant, design education researchers are able to focus on different intersections, or they can look at which areas their own approaches fit. Considering the micro-implicit-individual intersection area, they may discuss micro-level educational interventions used as teaching strategies to provide personal empathic awareness. Moreover, they may examine how citizenship educational projects, including empathic experiences or tools, have a longitudinal impact on the empathic identity constructions of learners and their interactions within a society, which reside in the macro-explicit-social intersection area.

2.6.2 Pedagogical implications for design teachers

Design teachers have crucial responsibilities for the development of design projects, courses and curricula, which can be regarded as meso-level educational interventions. Regarding pedagogical implications, this study shows that the learner's competence development is a very significant goal in the relationship of empathy with design education. Considering this framework, design teachers can comprehend which competences the student can develop with the educational interventions, so particular activities can be improved based on the design competences. This framework helps teachers to make an instructional design with a constructive alignment (Biggs and Tang, 2011) for teaching and developing empathy in design education. Constructive alignment establishes a mutual relationship between intended learning outcomes, teaching and learning activities, and assessment and feedback tasks; this way, students develop tendencies to participate in deep learning activities (Biggs and Tang, 2011), where we can observe its implications via a particular case from design education (Gelmez and Arkan, 2022). Thus, the design project or course alignment for empathy requires an integrative relationship between the educational interventions, the aspects and the contexts of empathy. To exemplify, a learning outcome aimed at developing learners' collaborative competence requires collaborative design projects by focusing on out-of-studio interactions in the course development. In the same way, the development of an empathic design approach can be supported by the integration of empathic tools or experiences or by the development of empathic teaching strategies in studio context, through the dimensional completion of interventions, aspects and contexts. In this way, teaching turns into a design activity (Goodyear, 2015), so the epistemic, set and social design of education can be delivered to the design students as an empathic experience.

Design teachers should also improve their own teaching strategies in an empathetic way. Herein, meso-level pedagogical interventions can be developed in line with teaching approaches to improve personal empathic awareness or in-studio interactions. In addition to the attitude towards developing learners' empathic capabilities and competences through out-of-studio interactions, it is very significant to maintain in-studio learner-teacher and peer/ group interactions in an empathetic manner.

2.6.3 Institutional implications for decision-makers

Educational institutions have macro-level and long-term pedagogical goals, placing empathy at the centre of citizen identity by debating morality, organizational compassion, sympathy and ethics. These discussions embody learners' interactions within social contexts and become a part of the designer and/ or researcher identities of the future.

For a sustainable integration of empathy into design education and its profound effects on teaching and learning processes, decision-makers are expected to think about and implement these three dimensions. Making the culture of empathy requires the organization of communities according to this purpose, facilitating empathic interactions, active and empathic listening in these communities, promoting self-awareness and evaluation as well as encouraging access to empathetic resources.

Decision-makers should address how macro-impact pedagogical goals reach the societal context to construct the learners' identity as empathic designers and citizens, which locate the macro-implicit-social intersection area. However, educational interventions have little relevance to the societal context, so the impact on social interactions is rather limited, as shown in Figure 2.8. In addition to promoting the competences of the learners with the activities they develop, the decision-makers also affect the teaching strategies of design teachers through particular attitudes they adopt.

3. DIVING INTO THE IMPACTS OF EMPATHY ON DESIGN LEARNING AND TEACHING²

In the field of design, empathy, which is often addressed in design research and practice, has also become an essential aspect of design education. It is both one of the core components of learning processes and a foundation for teaching activities. This paper aims to explore and discuss the impacts of empathy on learning and teaching in the relevant design education literature. Regarding this, eight themes appear in this study as cognitive, affective, interactive, collaborative, operative, perceptive, formative and connective impacts. While all these themes have considerable effects on the learning process, the impacts of empathy on teaching activities are relatively limited. In relation to the themes, research gaps are addressed, methodological and pedagogical implications for further studies are also presented.

3.1 Introduction

Empathy is a multi-layered and complex phenomenon, so yet there is no universally agreed definition on this term (López-León and Gómez-Valdez, 2018; Stojiljkovic' et al., 2012; Wiseman, 2007). The definitions of empathy cover a broad spectrum and differ depending on the aspects that are emphasized by the scholars (Stojiljkovic' et al., 2012, p. 961). Apparently, it is indicated that context is crucial while framing empathy (Wiseman, 2007). That is why, empathy has been defined in new contexts, and new relationships have been established beyond cognitive and emotional duality.

The etymological origin of empathy shows that the word comes from the root of the Greek word “*empathia*” from the early twentieth century within the coalesce of “*em-*,” the meaning of “*in*,” and “*pathos*”, the meaning of “*feeling*” (Merriam-Webster, n.d.). Lexically, empathy is defined as “the ability to share someone else’s feelings or experiences by imagining what it

² This chapter is based on the article: Efiliti, P. and Gelmez, K. (2024). A deep dive into the impacts of empathy on design learning and teaching. *International Journal of Technology and Design Education*, 34(2), 809–852. [© Springer Nature B.V.]

would be like to be in that person's situation" (Cambridge Dictionary, n.d.) involving emotional contagion, mimicry of gaze, and role-taking (Audi, 1999). Alongside enabling us to understand others and to promote emotional knowing, it is also argued as a felt, embodied, intersubjective experience, which offers self-understanding (Finlay, 2005) and expands awareness (Barrett-Lennard, 1962). Therefore, empathy begins with human interactions (Tracey and Baaki, 2022) and lies at the heart of the "sociality, intersubjectivity and capacity to understand another" (Finlay, 2005, p. 277).

Considering Howe's (2017) characterisation, empathy comes within a complex set of reflexive psychological characteristics associated with social intelligence, emotional literacy, mental state, etc. Being an empathic individual enables us to see and sense the viewpoints of others. The individual should also be aware that his/her own thoughts and feelings, and therefore what he/she says and does, can be affected by others, just as he/she affects others (Howe, 2017). Thus, empathy acts as a catalyst for human transformation (Lam and Suen, 2015).

3.2 The Importance of Understanding Empathy in Design Learning and Teaching

The issue of cognitive and emotional empathy development has been discussed at different levels of the education system (Konrath et al., 2011). Thus, how empathy is acquired and developed through design education has also been questioned recently (Tellez Bohorquez, 2017).

In the design field, this phenomenon deeply lies in user research and design practice (see Alzayed et al., 2021b; Heylighen and Dong, 2019; Mattelmäki et al., 2014) that allows understanding of others' emotions, behaviors, and interactions as well as promotes insights while designing products, services, environments, systems, and experiences for people (see Koskinen et al., 2003). Getting closer to the lives of the audience to create meaningful experiences is the key for empathic design. The sensitivity of designers towards humans, the application of techniques as well as their design potential increases through empathy (see Mattelmäki et al., 2014; Tracey and Baaki, 2022).

Moreover, within the context of design education, empathy cultivates the learning processes of design students and the teaching activities of teachers. It can be framed and conceptualized in many different ways, such as advancing the empathic understanding of design students (Altay,

2014), promoting empathic design methods and empathic skills for designers (Mattelmäki et al., 2014), creating empathic learning environments (Cooper, 2004), developing empathic interactions within design studio context (López- León and Gómez-Valdez, 2018), improving teacher empathy and related qualities as socialemotional competences (Aldrup et al., 2022), catalyzing a more empathic pedagogy for art and design education (Carlson and Dobson, 2020), fostering empathic professional identity development (Tracey and Baaki, 2022), etc. Rather than being innate, it is an ability that can be learned over time through the rise of self-awareness. Hence, recognizing the emotions, experiences, interests and biases in design also leads to the development of empathy for the self (Tracey and Baaki, 2022).

Empathy is one of the core components for social and emotional learning processes of students. Moreover, it is an essential source for teaching activities to have an influence on the effectiveness of teaching, the quality of teacher-learner interaction, and the management of learning environments (Aldrup et al., 2022).

However, limited studies on empathy (Zingoni, 2019) and its indirect and dispersed connections with design education literature (see Efiliti and Gelmez, 2023b) invite us to discover and understand how this multi-layered and complex phenomenon is related to design education and impacts design learning and teaching. More specifically, we address this research question:

What are the impacts of empathy on design learning and teaching within the design education literature?

In this study, to examine the current literature systematically and posit research gaps for future studies, the scoping review is adopted as a methodological framework. The scoping review aims to comprehensively identify and analyze all the relevant literature pertaining to a research objective, including rigorous and transparent stages, such as (1) identifying the research question and objective, (2) identifying relevant studies, (3) selecting studies, (4) charting the data, and (5) collating, summarizing, and reporting the results (Arksey and O'Malley, 2005). This type of review is a useful way of mapping the field of interest where it is difficult to visualize, disseminating research findings of particular areas of study, and identifying gaps in the existing research literature where no research has been conducted or the subject has not been studied adequately (Arksey and O'Malley, 2005; Mays et al., 2001). In other words, a

scoping review of the literature can be particularly beneficial if the topic has not yet been extensively reviewed or if it is complex or heterogeneous (Mays et al., 2001).

3.3 The Review Process

This study is a part of a research project focusing on empathy in design education (see Efilti and Gelmez, 2023b). The focus of this review is to understand the impacts of empathy on design learning and teaching in the existing design literature. Thus, the objectives of the study are:

- To discover and review the impacts of empathy on design learning and teaching on an international scale within the existing literature,
- To discuss these impacts and research gaps for further studies.

To identify studies that address empathy in design education, a search query was formulated. The search query consisted of the terms “empathy” OR “empathic” AND “design education,” OR “design studio,” OR “design pedagogy” in order to reach the relevant intersecting area of empathy and design learning, teaching, and education. Some adjustments were made in the search query according to the interface differences of the search platform. Google Scholar, Web of Science, ScienceDirect, and Scopus were searched via formulated search query between 19 and 27 April 2022 (Figure 3.1). Searching these databases yielded a total of 209 potential studies in English (3 articles in ScienceDirect, 40 articles in Google Scholar, 62 articles in Web of Science, 104 articles in Scopus). The time period was not taken into consideration during the literature search.

Databases	Search field	Search terms
ScienceDirect	search in title, abstract or author-specified keywords	<i>("empathy" OR "empathic") AND ("design education" OR "design studio" OR "design pedagogy")</i>
Google Scholar	search by disabling citations and patents	<i>"empathy" "empathic" "design education" "design studio" "design pedagogy"</i>
Web of Science	search in query preview	<i>TS=(("empathy" OR "empathic") AND ("design education" OR "design studio" OR "design pedagogy")) OR TI=(("empathy" OR "empathic") AND ("design education" OR "design studio" OR "design pedagogy")) OR AB=(("empathy" OR "empathic") AND ("design education" OR "design studio" OR "design pedagogy"))</i>
Scopus	search in title, abstract, and keywords	<i>TITLE-ABS-KEY (("empathy" OR "empathic") AND ("design education" OR "design studio" OR "design pedagogy"))</i>

Figure 3.1 : Search phrases.

To refine this search, the duplicate (n = 57) and non-access articles (n = 25) were excluded. Also, the sources without full-text articles, whole conference proceedings, books, book chapters, book forewords, reports, and dissertations (n = 25) were excluded from the review (Figure 3.2).

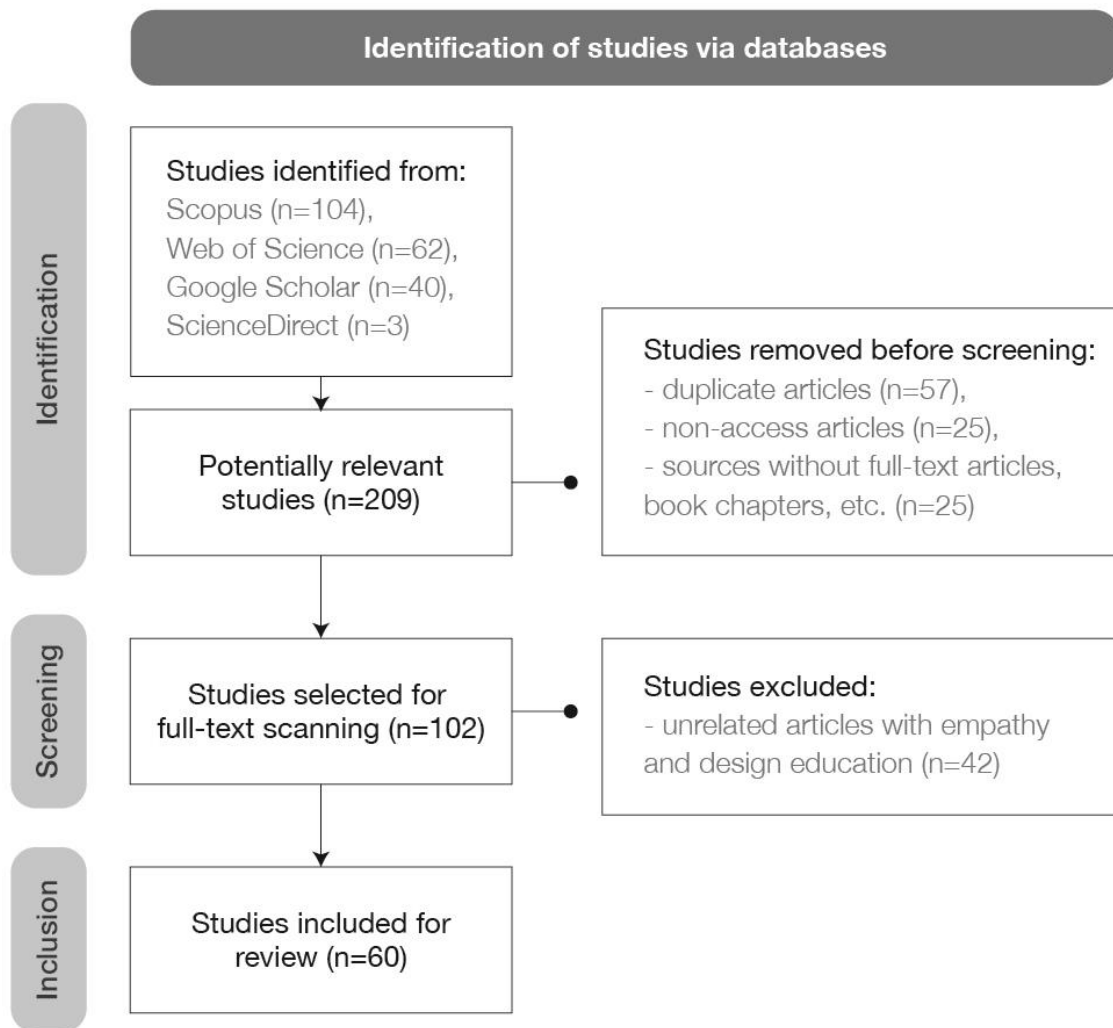


Figure 3.2 : Diagram of article selection.

After literature identification, 102 articles remained for screening for inclusion. A series of filters were applied to the remaining articles. As a first step, the articles were checked whether their scopes were related to design education, studio course, and pedagogy within the context of higher education. The higher education in this study includes adult learning and citizen education, which focuses on enhancing civic courage to make ethical design decisions “based

on critical thinking, social awareness, and action competence” (Santanicchia, 2020). Some of the articles were excluded if ...

- The article had no relation with design education, studio course, or pedagogy within art, design, architecture, and design engineering education,
- The article had no relation with higher education, adult learning, or citizen education.

Moreover, the articles were filtered by considering relevancy with empathy. To reach a wide spectrum of keywords related to empathy, the unfinished word “empath-” was searched within the articles. The articles were excluded if ...

- Any keywords related to empathy were not used throughout the text,
- Any keywords related to empathy were only used in reference lists or when citing others.

Then, the full texts of the remaining articles were repeatedly read and reviewed to achieve immersion. Regardless of the intensity of the use of the relevant keywords, articles were excluded if the concept of empathy was used in limited ways that cannot be related to learning or teaching activities. Thus, the articles were excluded if the concept of empathy was only used related to a kind of tool such as empathy probe, empathy mapping, empathy canvas, empathy modeling, etc., as empathic design, as empathy-driven research, as an empathic way of a method or exercise, or as a phase of design thinking but its relationship with design education, learning and teaching was not sufficiently constituted throughout the text.

After these filterings, 60 articles were included in the review process (Appendix E). These articles consisted of 37 journal articles, four of which were also presented at conferences, and 23 papers published in conference proceedings. The publication time span ranged from 2007 to 2022. The distributions of reviewed articles were illustrated by year and publication type (Figure 3.3). Here, we can say that the number of studies including a relationship between empathy and design learning and teaching has been increasing in the last 10 years.

We clustered the reviewed articles in terms of their disciplines which were the research terrains (see Appendix E). While most of the articles ($n = 37$) were related to design, some of them focused on engineering ($n = 10$) or included multidisciplinary approaches ($n = 13$). Under design-related disciplines, there were articles about interior (architecture and environmental)

design, architecture, industrial design, graphic design, interaction design, game design, etc. Under engineering-related disciplines, there were articles about engineering design mainly including biomedical, mechanical, and civil engineering, as well as information technology. In addition, multidisciplinary studies referred to the articles included more than one discipline together, such as art and engineering, design and science, art and business, or design and medicine.

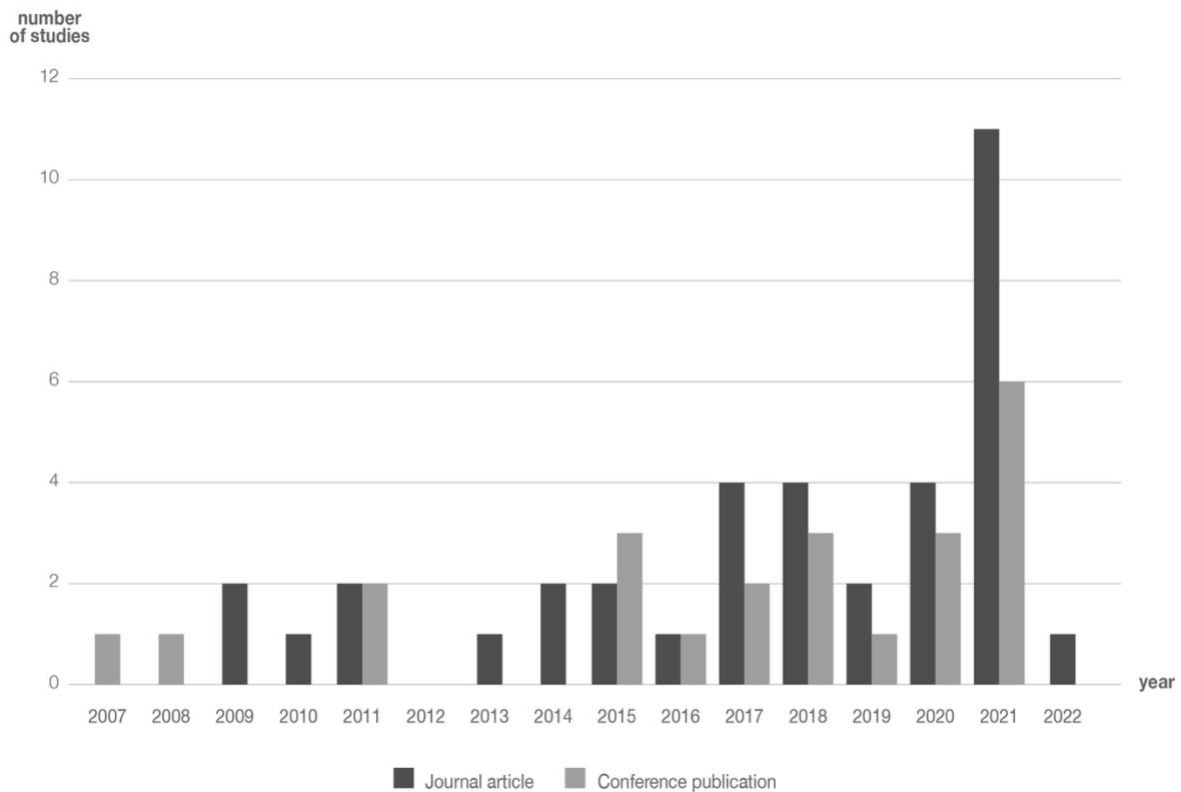


Figure 3.3 : Reviewed articles by the year and publication type.

56 of the reviewed articles were empirical papers, two of them were discussion and the other two were reflective papers (see Appendix E). Most of them were based on case studies, which worked through the development and implementation of a design course, project, workshop, etc. Different methods were used in these articles, such as unobtrusive observation, surveys, interviews, focus groups, workshops, experiments, etc. As a data collection method, whereas some of them utilized learning diaries, essays, or posters of students, some presented critical reflections of researchers.

Most of the articles have topics highly connected with social issues, such as inclusive design, social and environmental justice, social impact and innovation, design against crime, design for social change, universal design, designing products or services for diverse users, and social responsibility. Citizen education and career development are also discussed alongside design teaching and pedagogy. Quite a few of them center upon empathic learning, the development of student abilities, their perception changes towards empathy, and team formation.

3.3.1 Data analysis

In this stage, we interrogated the impacts of empathy on design learning and teaching addressed in the reviewed articles. The data segments describing a relation of empathy with design learning and teaching were extracted from the 60 articles. In total, 298 segments were specified from the reviewed articles and they were associated with 511 codes.

We thematically analyzed the data segments in order to develop a wider understanding about this research phenomenon. Thematic analysis is the process of searching and identifying repetitious themes throughout the qualitative data (Clarke and Braun, 2013) to provide a comprehensive understanding about and a holistic picture of the research subject (Boyatzis, 1998). During the thematic analysis, the researcher moves back and forth throughout the particular phases of recognizing the data, coding, sorting and collating the codes into patterns and potential themes, reviewing and refining the themes. In this process, themes, and sub-themes, which represent the theoretical position and the interpretation of the analyst, are “emerged” or “discovered” regarding the decision, selection, and organization of the analyst regarding the research questions (Clarke and Braun, 2013; Saldaña, 2013).

In data analysis, we benefited from both inductive and deductive approaches to determine codes, sub-themes, and themes (Saldaña, 2013).

3.4 Themes

Regarding the impacts of empathy on design learning and teaching in the relevant literature, eight themes appear: cognitive, affective, interactive, collaborative, operative, perceptive, formative, and connective (Table 3.1).

The fundamental dichotomy in the literature is seen between cognitive empathy (a recognising capability) and affective empathy (an instinctive sympathetic reactivity) (see Davis, 1980). When we look at the relations established between empathy and design learning and teaching activities, cognitive and affective themes have influences on the other themes as they lay the foundation for the capability of empathic understanding.

Regarding 511 codes, the theme of *cognitive impact* is coded 55 times including cognitive and meta-cognitive development sub-themes. 50 codes are associated with cognitive development and 5 codes with meta-cognitive development. Regarding the improvement of the emotional domain, the *affective impact* theme is coded 64 times. While the development of emotional awareness has 26 codes, emotional skill development is related to 38 codes. The theme of *interactive impact* is represented with 101 codes. Under this theme, improvement of the learners' interactions with the user/stakeholder is mentioned 86 times, improvement of the learners' interactions with the peers and/or within the groups/teams mentioned 13 times, and improvement of the interactions between learners and teachers mentioned only two times. The theme of *collaborative impact*, which is related to the improvement of learners' collaborations with users, peers, communities, etc., is associated with 31 codes. In addition to this, 108 codes are associated with the *operative impact* theme, which is related to the development of design practice with 56 codes, design outcome with 39 codes, and learning components with 13 codes. The *perceptive impact* theme includes 65 codes regarding the development of understanding about social issues mentioned 18 times, the adoption of new design approaches mentioned 27 times, and the development of teaching approaches mentioned 20 times. The theme of *formative impact*, which is represented by 87 codes, contains the development of personal traits with 32 codes, designer identity with 42 codes, researcher identity with three codes, citizen identity with four codes, and teacher profile with six codes. Lastly, the theme of *connective impact* has 27 codes. Under this theme, the sub-theme of improvement of learners' engagement is associated with seven codes and the development of pedagogical interventions is related to 20 codes.

The approximate percentage distributions of each theme and sub-theme are also indicated over the 511 codes (see Table 3.1).

Table 3.1 : Themes and sub-themes.

Themes	Sub-themes	Codes	Percentage
Cognitive impact	Cognitive development ³	50	8.9
	Meta-cognitive development	5	1.0
Affective impact	Development of emotional awareness	26	5.1
	Emotional skill development ³	38	7.4
Interactive impact	Improvement of the learners' interactions with the user/stakeholder	86	16.8
	Improvement of the learners' interactions with the peers and/or within the groups/teams ⁴	13	2.5
	Improvement of the interactions between learners and teachers	2	0.4
Collaborative impact	Improvement of the collaborations ⁴	31	6.1
	Development of design practice	56	11.0
Operative impact	Development of design outcome	39	7.6
	Development of learning components	13	2.5
Perceptive impact	Development of understanding about social issues	18	3.5
	Adoption of new design approaches	27	5.3
	Development of teaching approaches	20	3.9
Formative impact	Development of personal traits	32	6.3
	Development of designer identity	42	8.2
	Development of researcher identity	3	0.6
	Development of citizen identity	4	0.8
	Development of teacher profile	6	1.1
Connective impact	Improvement of learners' engagement	7	1.4
	Development of pedagogical interventions	20	3.9

3.4.1 Cognitive impact of empathy

This review study shows that empathy has cognitive impacts on learning activities (10.8%). The cognitive impact is related to the thinking skills of learners, which is elaborated in the seminal book of Bloom et al. (1956) that specifies educational objectives with the constructivist perspective. Under the influence of empathy, this theme addresses the knowledge acquisition

³ Both cognitive development and emotional skill development sub-themes include the same 14 codes (2,7%).

⁴ Both the improvement of the collaborations and the improvement of the learners' interactions with the peers and/or within the groups/teams sub-themes include the same 13 codes (2,5%).

of learners escalating in various complexities and their thinking skill development regarding design.

The relation of empathy with *cognitive development* (9.8%) promotes the base of learning (Carlson and Dobson, 2020). It contributes to the learning processes (Lopez-Neri and Gomez-Davila, 2018), which enables learners to acquire new knowledge (Medola et al., 2021), offers a holistic understanding about the problems (Peng and Kueh, 2022), promotes empathic understanding (Altay, 2017; Altay and Porter, 2021), paves the way for cross-cultural and mutual learning (Ho et al., 2011), and leads to positive learning outcomes (Zingoni, 2019). Cognitive impact also improves the competences of learners. In particular, cognitive abilities, creative skills, engagement and research skills (Christian, 2019; Vaes et al., 2011), thinking strategies like creative thinking, critical thinking, design thinking, and decision-making (Carlson and Dobson, 2020; Christian, 2019) are cultivated and help learners to deal with different challenges and problems in design (Wiebe and Seaton, 2021).

Moreover, *meta-cognitive development* (1%) of learners (Peng and Kueh, 2022) is also promoted by empathic gains. A deeper reflection and self-efficacy of learners are fostered (Alzayed et al., 2021a, 2021b; Carlson and Dobson, 2020) through empathy. Moreover, it facilitates learners' interpretations regarding diverse user groups and enables them to make cognitive and emotional connections among different design concepts (Altay, 2017) by expanding their empathic horizons (Altay, 2017; Altay and Porter, 2021; McDonagh and Thomas, 2010).

3.4.2 Affective impact of empathy

The other fundamental relation of empathy with design learning is the affective impacts (12.5%). In this respect, affective objectives include “a feeling tone, an emotion, or a degree of acceptance or rejection” that deal with things emotionally and direct “interests, attitudes, appreciations, values and emotional sets or biases” (Krathwohl et al., 1973, p. 7). This theme refers to the emotional growth and skill development of learners through empathy.

The *development of emotional awareness* of learners (5.1%) has impacts on learning and design processes in order to help them to be emotionally literate (see Spendlove, 2009). Notably, design awareness, then emotional, empathic, social, and environmental awareness (Christian, 2019; Medola et al., 2018; Vaes et al., 2011) and sensitivity of learners (Brueggemann et al.,

2017) that support the affective process of learning (Altay and Demirkan, 2014) are fostered through empathy.

Affective impact also correlates with the *emotional skill development* (7.4%) of learners (Roja et al., 2020), some of which are also shared with cognitive development (2.7%). Particularly empathic and emotional skills (Roja et al., 2020); Zingoni, 2019); moreover, collaboration, communication, engagement, inclusion, and research skills are improved (de Freitas and Almendra, 2021; de Vere and Charny, 2017). Besides, social competences and skills (McDonagh, 2015) cultivate interpersonal interactions and relationships in-groups and amongst peers (Malins and McDonagh, 2008; Turner, 2021).

3.4.3 Interactive impact of empathy

The interactive impacts of empathy on design learning and teaching are one of the most prominent themes in this study (19.7%). Interacting with other people assists learners “to organize their thoughts, reflect on their understanding, and find gaps in their reasoning. Underneath the broad umbrella of social interactions and learning, variants can range from peer learning, reciprocal teaching, learning by teaching, learning by observation, learning by doing, and self–other monitoring” (Okita, 2012, p. 3104). Human interactions are also the initiatives of empathy (Tracey and Baaki, 2022). Thus, this theme represents the interpersonal interactions inside and outside of the studio courses regarding learning and teaching activities. Learners utilize empathy to resolve interpersonal differences about users, stakeholders, peers, and teachers; moreover, they gain empathic understanding and insights from those interactions.

The concept of empathy is related to *learners’ interactions with the user/stakeholder* (16.8%) at the most, which considerably shapes their learning activities. Empathy is the fundamental requirement in order to enable learners to engage with users (Altay et al., 2016; Wiebe and Seaton, 2021), to deepen the understanding and develop awareness about users’ needs, desires, expectations, and experiences (Altay and Porter, 2021; Chmela-Jones, 2017; Ho et al., 2011; Mendola et al., 2018; Rieger and Rolfe, 2021; Santanicchia, 2020), to support cognitive and emotional states (Brueggemann et al., 2017; Shin and Thomas, 2015), and difficulties they face (Medola et al., 2018), to develop an emotional connection with users (Altay, 2014). It also enables learners to take users’ perspectives and values (Altay, 2017; Shin and Thomas, 2015), to put themselves mentally in the place of the users (Gielen, 2009), to see the environment from

the eyes of users (Altay, 2014), to position users and stakeholders as active partners in the design process (Brueggemann et al., 2017; McDonagh and Thomas, 2010), to promote to think together with them (Şenyiğit and Yılmaz, 2021), to close the knowledge gap (McDonagh, 2015) and to see conceptual distinctions within the target group (Brueggemann et al., 2017).

This study also shows that the concept of empathy is related to *learners' interactions with their peers and/or within the groups/teams* (2.5%). Empathy leads learners to engage with their peers (Carlson and Dobson, 2020; Turner, 2021) and brings them closer by inviting them to develop a shared language (Brueggemann et al., 2017) and compassion (Altay and Porter, 2021) by inducing a sense of belonging (Carlson and Dobson, 2020), through peercritiquing (Turner, 2021). By this way, communication skills (Brueggemann et al., 2017; Davidová, 2020) and empathic connections (Noel, 2021; Pezeshki et al., 2015) built in group interactions (Haag and Marsden, 2019) are shaped.

Also, the concept of empathy has been related to *learners' interactions with teachers* (0.4%) that influence both learning and teaching activities. Empathy enables to promote the engagement of learners and teachers (de Freitas and Almendra, 2021), to improve empathic relationships among them, to enhance learning and teaching moments in a design studio/ course environment (López-León and Gómez-Valdez, 2018).

3.4.4 Collaborative impact of empathy

The collaborative impacts of empathy on design learning and teaching is another theme, which is revealed in this study (6.1%). Collaboration includes “sharing of information to build on knowledge, an exchange of skills to build on a technique, a contribution of an element to build a greater whole” (Lane and Tegtmeier, 2020), also creates “ideal circumstances when examining the impact of social interactions on learning” (Okita, 2012, p. 3104). This theme addresses the collaborations of learners inside and outside of the studio supporting their learning activities and strengthening social structures with empathic understanding.

The *collaborations of learners* are highly correlated to their interpersonal interactions, so the engagement of learners with users and peers, sense of belonging, development of compassion, and empathic in-group connection are also included in this theme. Moreover, empathy has a positive contribution to collaboration (Noel, 2021; Turner, 2021) through power sharing of learners, promoting teamwork, partnership, and organization (McDonagh et al., 2011; Lopez-

Neri et al., 2018), learning from each other, collective creativity, problem-solving, and synergy (Carlson and Dobson, 2020; Davidová, 2020), as well as building empathic communities (Noel, 2021), all of which shape the collaborative skills of learners.

3.4.5 Operative impact of empathy

This study reveals that the operative impacts of empathy on design learning and teaching activities have the highest percentage (21.1%), which has a performance-oriented approach. A performative stance “reveals aspects of embodied and designerly engagement with methods as it relates to design action under the control of a designer. In this stance, methods are taken up as tools to aid the designer in forming design judgments and making decisions” (Gray, 2022, p. 5). Therefore, learners’ empathic understanding gained through interpersonal interactions create insights to shape design works; moreover, teachers’ empathic interactions lead to the development of teaching activities.

The review shows that the concept of empathy is crucially related to the *design process* (11%). It enhances design activity (McDonagh et al., 2011; Schmitt et al., 2016) by enabling to contextualize design strategies, reframe and solve the problems (see Mitchell and Light, 2018; Swaranjali et al., 2021), develop design awareness and creativity, transfer insights from research to ideation phase (Boess et al., 2007; Şenyiğit and Yılmaz, 2021), i.e. design inspiration (Lee et al., 2011), integrate into different phases of the design process, such as analysis, creation, verification (Vaes et al., 2011), elicitation (Schmitt et al., 2016), and concept evaluation (Prabhu et al., 2021a, 2021b). It leads to the development of lateral and design thinking as well as propels design decision processes (Shin and Thomas, 2015). Moreover, empathy shapes in-group performance of learners and affects their collective idea generation and selection phases (Alzayed et al., 2020).

Alongside the design process, the reviewed articles establish particular relations between empathy and the *design outcomes* (7.6%). It reflects on design decisions and contributes to the outcome of design activity (Altay et al., 2016; Lorentzen and Hedvall, 2018; McDonagh and Thomas, 2010; Prabhu et al., 2021a, 2021b), leads to the development of more appealing, authentic, broader, cost-effective, creative, diverse, effective, innovative, meaningful, sensitive, viable design solutions (de Vere and Charny, 2017; McDonagh and Thomas, 2010; McDonagh et al., 2011; Rieger and Rolfe, 2021; Swaranjali et al., 2021); besides, helps to construct

sustainability and inclusive futures (Peng and Kueh, 2022) via empathic responses (Zingoni, 2019). The success of the projects (Davidová, 2020; Mitchell and Light, 2018) is also affected.

If we consider teaching as a design activity, teachers can be considered the designers of education (Goodyear, 2015). Transformative, authentic and cross-cultural learning are promoted by the development of *learning components* (2.5%). Creating nontraditional and empathic learning climates and classrooms for the learners' engagement is one of the learning components design teachers seek for. They also concentrate on rethinking the curriculum and educational systems for the development of new learning objectives and experiences regarding empathy (Shin and Thomas, 2015; Swaranjali et al., 2021), learning concepts for promoting motivations of learners and methods for facilitating learning processes (Lopez-Neri et al., 2018).

3.4.6 Perceptive impact of empathy

The perceptive impacts of empathy on design learning and teaching have a crucial percentage (12.7%). According to Koskinen et al. (2003), "empathy is our intuitive ability to identify with other people's inner states," by helping to immerse ourselves in the others' experience. The immersion in others' realities can foster holistic understanding and inspiration. By this way, the insights can be uncovered for the development of new experiences for others. On the other hand, immersion, which involves social- and self-awareness, leads to a change in mindset and regulates the views of the world through the perspective of others (Mattelmäki et al., 2014). This theme represents the new mindset development of both learners and design teachers. While the empathic understanding shapes the design approaches and designer mindset of the learners, it also leads to the development of new teaching approaches of design teachers.

Establishing empathy with diverse and unrepresented users or stakeholders correlates with the *development of understanding about social issues* (3.5%), especially leads to learning about sensitive topics, such as disability (Altay, 2017; Altay and Demirkan, 2014; Rieger and Rolfe, 2021), crime (Gamman and Thorpe, 2018), severe illnesses (Annemans et al., 2015); elderliness (Natu, 2020), etc.

Rising awareness about social issues also penetrates the perceptions of learners and leads them to *adopt new design approaches* (5.3%) regarding empathy. Learners engage with inclusive design (Altay and Porter, 2021; Rieger and Rolfe, 2021), social design (López- León and

Gómez-Valdez, 2018; Swaranjali et al., 2021), universal design (Şenyiğit and Yılmaz, 2021), and sustainability (Prabhu et al., 2021a, 2021b). Moreover, they can care about social change (Boess et al., 2007), environmental and social issues and justice (Davidová, 2020; de Vere and Phillips, 2015; Prabhu et al., 2021a, 2021b). By this way, the designer mindset of learners (Swaranjali et al., 2021) is transformed and reconstructed toward the users, so a more empathic approach can be developed (Annemans et al., 2015; Lee et al., 2011; McDonagh, 2015).

Teachers' pedagogical roles consist of particular teaching approaches, personal characteristics, psychological factors, and interpersonal communication (see Efilti and Gelmez, 2021, 2023a; Grasha, 1996). Thus, the *teaching approaches* of design teachers (3.9%) can also be shaped in a way that provide the development of empathy, such as promoting empathic design thinking (Malins and McDonagh, 2008), empathic research methods and tools (Campbell and McDonagh, 2009; Schmitt et al., 2016) and integrating it into learning activities, such as including empathic design, universal design, inclusive design, and gerontology in the curriculum (Altay, 2017; Rieger and Rolfe, 2021; Swaranjali et al., 2021). Moreover, design teachers develop their approaches and promote empathic teaching (Mitchell and Light, 2018) with the awareness of educating empathic individuals and researchers (Campbell and McDonagh, 2009), as well as preparing them for real-life experiences (Davidová, 2020).

3.4.7 Formative impact of empathy

The formative impacts of empathy on design learning and teaching are another most prominent theme (17%), closely related to identity formation. In design education, “professional identity is socially constructed via interactions with others, particularly those in one’s community of practice; professional identity is constantly being formed and reformed, although changes to core identity features may develop slowly; and professional identity is constituted in and emerges from dynamic interpretations and narrations” (Tracey and Hutchinson, 2013, p. 29). Professional identity development is related to beliefs, experiences, and selfawareness of individuals (Tracey and Hutchinson, 2013), who “use their personal experience to actively construct their identity in relation to ideas, others, and to themselves” (Rick et al., 2012, p. 126). Empathic understanding and learning shape both the personal and professional development of learners. Moreover, the teacher profiles of design instructors, lecturers, supporting staff, etc. undergo a change via empathic gains.

Identity formation primarily relates to the *development of personal traits* (6.3%) that has direct effects on citizen, designer, and researcher identities. Empathy positively affects the personal characteristics of learners in different ways, such as expanding the worldviews of individuals, leading them to be a socially-determined individual (Swaranjali et al., 2021), prompting democratic engagement (Mendoza and Matyók, 2013), developing confidence, compassion, courage, sensibility (Medola et al., 2021; Santanicchia, 2020). It paves the way for the improvement of awareness, empathic viewpoint, communication capabilities, cultural perception, self-efficacy, and wellbeing (Altay and Porter, 2021; Alzayed et al., 2021a, 2021b; Peng and Kueh, 2022), as well as in-group interactions and identities of learners (Haag and Marsden, 2019; Peng and Kueh, 2022).

The development of personality traits of learners shapes their *designer identities* and abilities (8.2%) to a considerable extent. Learners become more creative, confident, empathic, ethical, and responsible designers (Christian, 2019; Prabhu et al., 2021a; Rieger and Rolfe, 2021) in order to be ready for real-life experiences and professional life (McDonagh, 2015), to develop their designer skills (McDonagh, 2015) like emotional and social skills (Prabhu et al., 2021a, 2021b), and also entrepreneur mindset (Bell-Huff and Morano, 2017). These can be developed through their willingness to help someone (Medola et al., 2021) and the value given for the discipline (Zingoni, 2019). Moreover, collaborating and thinking together with others (Şenyiğit and Yılmaz, 2021), dealing with real-life problems and designing for future needs (McDonagh, 2015), seeing from others' eyes, and also their ability to use various design tools and methods (Schmitt et al., 2016) are advanced. The *researcher identity* (0.6%) is also changed toward being a more compassionate, ethical, and socially active researcher (Campbell and McDonagh, 2009). Besides, personality changes shape the *citizen identity* (0.8%) by prompting them to be empathic, global, and responsible citizens (Carlson and Dobson, 2020; Mendoza and Matyók, 2013; Rieger and Rolfe, 2021).

The empathic understanding and interactions also reflect on the *teachers' profile* (1.1%) in a constructive way as leading them to be more empathic and willing teachers (López-León and Gómez-Valdez, 2018). Empathic teachers give more importance to understanding student moods and problems and also offering space for motivation (López-León and Gómez-Valdez, 2018; Zeivots et al., 2021).

3.4.8 Connective impact of empathy

This review study shows that the concept of empathy has connective impacts on design learning and teaching (5.3%), especially for student engagement in the learning experiences. Within the context of higher education, student engagement is defined “as the quality and quantity of students’ psychological, cognitive, emotional and behavioral reactions to the learning process as well as to in-class/out-of-class academic and social activities to achieve successful learning outcomes” (Gunuc and Kuzu, 2015, p. 588). The connective relations correspond to the learners’ involvement in learning activities by increasing their care about learning as well as the design teachers’ educational developments. Empathic understanding leads design teachers to rethink educational dimensions regarding empathy and develop different pedagogical interventions.

Empathy seems like a catalyst providing *learners’ engagement* (1.4%) in the courses (Altay and Demirkan, 2014; Medola et al., 2018), design studio and design projects (Christian, 2019; Lorentzen and Hedvall, 2018; Shin and Thomas, 2015), and triggering their commitments for learning processes (see Peng and Kueh, 2022; Swaranjali et al., 2021).

Design teachers provide different *pedagogical interventions* (3.9%) considering educating the empathic designers of the future (Altay, 2017; López-León and Gómez-Valdez, 2018). Aiming to increase learners’ care and provide their commitment to learning processes, teaching strategies as interventions for promoting engagement (Peng and Kueh, 2022) are addressed by teachers as pedagogical goals (Swaranjali et al., 2021). Moreover, they can propose distinctive teaching tools, materials, and strategies (Gamman and Thorpe, 2018; Shin and Thomas, 2015) for performance-based pedagogy (Campbell and McDonagh, 2009), integrate empathy in design education and develop new ways of teaching, educational dynamics, and teaching objectives (Davidová, 2020; Roja et al., 2020; Zingoni, 2019) for empathic education. The interventions mediating empathy development and pedagogy (Carlson and Dobson, 2020) can also promote learners’ reflection (Swaranjali et al., 2021), and lead to the transformation of learning (Carlson and Dobson, 2020).

3.5 Concluding Remarks

Learning and teaching are intertwined in a mutual reflection within the educational context, so it is difficult to disassociate them from each other. It is even more challenging within the scope of design studio education, which is based upon “the social and participatory nature of teaching and learning” (Verenikina, 2008). However, learning and teaching are the activities *sui generis* at heart (Biggs and Tang, 2011). Apart from the teaching intentions, the perception of students determines what they learn and the learning context shapes how they learn (Biggs and Tang, 2011). In this study, we aim to address the impacts of empathy regarding design learning and design teaching together: how empathy penetrates into the design education context, transforms the students’ learning processes and steers design teaching activities.

Figure 3.4 depicts the relative impacts of empathy mentioned in the literature by comparing design learning and teaching. When we look at the impacts of empathy on design learning and teaching, we can see that all impacts are mostly mentioned in the reviewed articles in relation with design learning. However, the interactive, operative, perceptive, formative, and connective impacts of empathy have relations with design teaching (Figure 3.4).

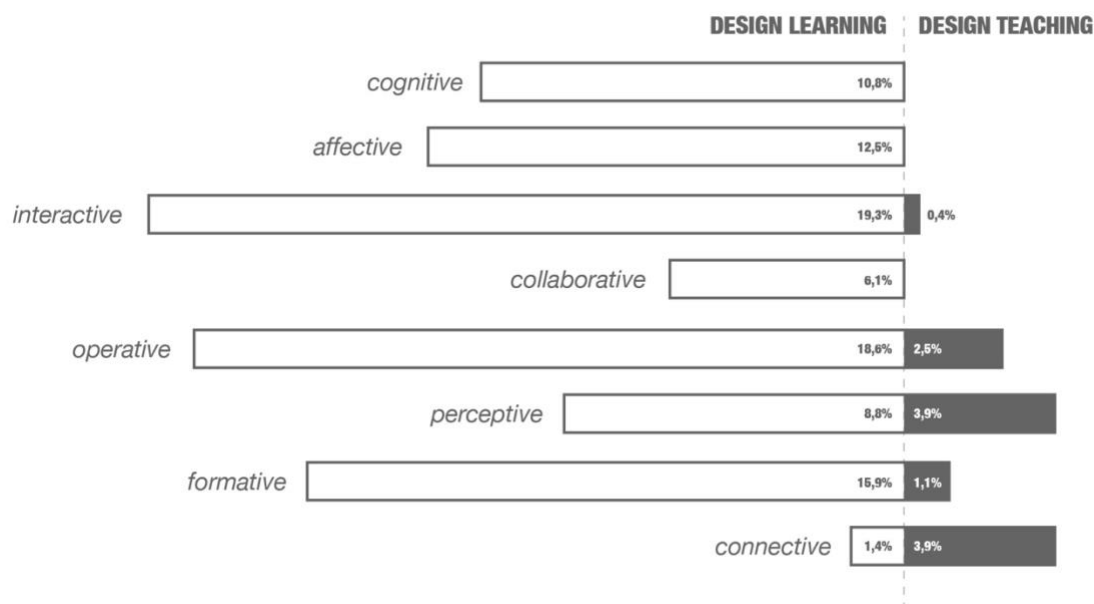


Figure 3.4 : The distribution of themes regarding design learning and teaching.

We can say that the *cognitive*, *affective*, *interactive*, *collaborative*, and *operative* impacts of empathy on design learning are more visible in the literature as it is mostly related to user

research and design practice. The *perceptive* and *formative* impacts of empathy require more longitudinal examinations to understand the development of new approaches and the constructions of empathic identities. Moreover, the *connective* impacts are related to the engagement of learners and the development of empathic ways of teaching, which are relatively less mentioned in the relevant literature.

Considering the cognitive, affective, interactive, collaborative, and operative themes, it is possible to find studies on the side of learning processes. The literature often correlates empathy with cognitive and affective developments of design students. However, the cognitive and affective impacts of empathy on the design teaching side are open to investigation, which is related to the academic competencies of design teachers, such as “teaching skills, curricular planning, or scholarly knowledge of the field” (Bozkurt and Ozden, 2010). On the other hand, the interactive impact of empathy has a limited relation with teaching activities that represent student–teacher interaction. As a backbone of design studio education, the kind and degree of interaction established between design students and teachers determine the efficiency of both learning and teaching activities. Thus, how more empathic interactions can be constructed in design courses have potential for further studies. The collaborative impact of empathy is again related to the design students’ learning processes mostly. It can be interrogated how empathic collaborations can be cultivated regarding design teachers and teaching activities. In a similar vein, the operative impact of empathy addressing performance-oriented activities is related to design practice and learning. Yet, teaching including epistemic, set and social design of education can be discussed as a design activity in fact (Goodyear, 2015), thus teaching performances of design teachers can be examined in their particular operative phases regarding empathy. When we look at the perceptive impact of empathy, we can say that there is a relatively closer distribution between learning and teaching. It is really important to scrutinize in future studies how design education cultivates more empathic design approaches, designer, researcher, and citizen identities for design students. Also, under transformative pedagogy, it will be beneficial to discuss how empathic interactions embody teaching approaches, occupational and citizen identities of design teachers. For instance, the attributions of being an empathic teacher can be a research subject that also directs the teaching strategies toward more empathic design pedagogy. Lastly, the connective impact of empathy is more involved in the teaching side, unlike the others. Under this theme, it can be delved into how empathic

interactions lead to the engagement of design students in the learning process. It may also be centered upon the development of an empathic teaching model in order to raise the empathic designers of the future.

We offer that our framework in this study can be utilized both methodologically and pedagogically. Toward a more learner-centered approach, empathy serves as a motivational concept for new learning methodologies (see Bozkurt and Ozden, 2010; Lopez-Neri et al., 2018). As methodological implications, researchers may develop methods to make empathy explicit in design education and to understand its impacts in design education. They may also seek to reify empathy in education through means, experiences, stimulations, etc (see Efilti and Gelmez, 2023b). For instance, according to López-León and Gómez-Valdez (2018), developing tools may provide a fertile ground for promoting empathy in learning environments. Besides, these methodological interventions may provide a repertoire for design teachers to create more positive studio dialogues and interactions. Therefore, as pedagogical implications, scholars and institutions can discuss this model holistically for the development of pedagogical strategies by adopting a longitudinal attitude in order to meet the needs of the students (see Cooper, 2002, 2004). Aiming to support the empathy development of both students and teachers, establishing empathic learning environments and developing teaching as a pedagogical design activity gain prominence (see López- León and Gómez-Valdez, 2018).

As it can be seen in this study, there is a scarce amount of study that discusses empathy within the scope of design education. For this reason, as a research limitation, we can acknowledge that this study includes articles accessed from relevant databases based on the design education literature. However, as the literature suggests, empathy is a fundamental asset for learning processes and teaching activities. We think that the outcomes of this study will guide scholars, institutions, and researchers on the examination and utilization of empathy within the context of design education.



4. ELICITING EMPATHY EMBEDDED IN DESIGN CONVERSATIONS⁵

This paper aims to interrogate the design studio conversations between teachers and students in order to explore the indicators regarding empathy. To investigate design conversations occurring between design teachers and design students, participant observation studies were conducted at two universities in Finland and Turkey. As an empathic indicator, we addressed (1) how design teachers take the perspective of other agencies and (2) what deliveries are utilised for empathic perspective-taking. It was understood that design teachers identify themselves with both human and non-human agencies as design students, users, and materials. Moreover, deliveries leading to the identification of design teachers with these agencies included both discursive and performative means.

4.1 Introduction

In the field of design, empathy penetrates research, communication, and ideation processes regarding user research and design practice (see Kouprie and Sleeswijk Visser, 2009; Mattelmäki et al., 2014). In user-centred design, designers aim to understand users' realities deeply to gain insight into their experiences, needs, and desires in order to integrate contextual and affective factors into design (see Heylighen and Dong, 2019; Kouprie and Sleeswijk Visser, 2009). To inform designers about the experiences of users, particular tools and techniques have been developed (Fulton Suri, 2003). In this respect, designers can establish empathy through direct contact with users by observing and participating in their activities; through communication tools that convey the users' stories via videos and personas; and through imagination by simulating the users' conditions like role-playing (see Kouprie and Sleeswijk Visser, 2009; van Rijn et al., 2011).

⁵ This chapter is based on the article: Efilti, P. and Gelmez, K. (2024). Eliciting empathy embedded in design conversations: Empathic perspective-taking of design teachers towards design students, users, and materials. *International Journal of Art and Design Education*. [© John Wiley & Sons, Inc]

Empathy in design is closely associated with perspective-taking, which is the ability to take others' points of view, to imagine their emotions, thoughts, and feelings (Devecchi and Guerrini, 2017). As an intentional act of perceiving *sui generis* (Stein, 1989), designers "imagine what it would be like for themselves to be (in the position of) the user" (Kouprie and Sleeswijk Visser, 2009, p. 438) through a range of activities of projection, internalisation, objectification, identification, and imagination (see Tellez Bohorquez, 2017; Thompson, 2005). Thus, empathy is described through the metaphors of taking a walk in the other person's shoes (see Eymard et al., 2010; Walton, 2015), feeling with another person and imaginatively projecting oneself into the perspective of others (see Koskinen and Battarbee, 2003), stepping in and out of the lives of users (see Kouprie and Sleeswijk Visser, 2009), coupling voluntary with the living bodies (see Thompson, 2005), or a leap of imagination into someone else's head (see Walton, 2015).

As understood from the literature, empathy relies on a special kind of imaginative experience (Fulton Suri, 2003; Walton, 2015) including both self- and other-oriented perspectives. While the self-oriented perspective is based on "how one would think and feel in another's situation," other-oriented perspective is based on "imagining how another feels or thinks" (see Batson, 2009; Batson et al., 1997; Hess and Fila, 2016). These are the interchangeable and intertwined forms of perspective-taking (Batson et al., 1997).

4.2 Empathy in Design Education

Within the context of design education, empathy transforms the learning processes of students. It is mostly addressed and examined through student-user interactions (see Efilti and Gelmez, 2023b, Shin and Thomas, 2015, Şenyiğit and Yılmaz, 2021; Vaes et al., 2011). Establishing empathy with users is quite essential for design students to understand their realities and inspire design practice to develop products, services, systems, and experiences to meet human needs and aspirations (Tellez Bohorquez, 2017). Thus, design education focuses on developing students' empathic understanding towards users (Altay, 2014), cultivating their sensitivities and awareness (Şenyiğit and Yılmaz, 2021), promoting their empathic abilities and tendencies for intersubjectivity by equipping them with particular tools, methods, and approaches (see Koskinen and Battarbee, 2003). Therefore, empathy has crucial

impacts on design processes, approaches, and outcomes of students (see Mattelmäki et al., 2014), emotional growth and thinking skills (see Carlson and Dobson, 2020), collaborations and interpersonal interactions (see Altay, 2014; López-León and Gómez-Valdez, 2018; Şenyiğit and Yılmaz, 2021), as well as identity development (see Tracey and Baaki, 2022). Moreover, empathic interaction and understanding between design students and teachers provide learners' engagement in design courses and trigger their commitment to learning (see Shin and Thomas, 2015). On the other hand, non-empathic experiences in design education may increase the stress level and decrease the motivation of students, affecting students' engagement in learning and class performances (Meyers et al., 2019; Zhang, 2022).

As an essential deliverable of design pedagogy, empathy also steers design teaching activities (see Efilti and Gelmez, 2024a). It shapes the pedagogical interventions of design teachers and cultivates their professional identities (see Efilti and Gelmez, 2024a). As a central component of the social-emotional competence of a design teacher, empathy also plays a crucial role in the effectiveness of teaching and the quality of teacher-student communication in particular (Aldrup et al., 2022). Alongside equipping design students and teachers for professional life, empathy also provides a blueprint for a more inclusive learning environment (Carlson and Dobson, 2020) against unequal power relations in education (see Freire, 1970; Webster, 2006). A more empathic pedagogy for art and design education helps design teachers to enhance learning activities and tools, curriculum (Jatin, 2021), dialogue and critique in the studio (Tellez Bohorquez, 2017) considering the educational needs of diversified learners (Cooper, 2002). Moreover, empathic approaches regarding design teaching can lead to the establishment of empathic teacher-student interactions in design education (López-León and Gómez-Valdez, 2018). Therefore, in the quest for empathic design education, explication and embodiment of empathy in design education can help to develop new ways of teaching.

Training empathic teachers promotes students' learning processes and nurtures professional performances intertwined with the complexity of the concept of empathy composed of cognitive, emotional, behavioural and moral components (López-León and Gómez-Valdez, 2018). Thus, exploring teacher empathy in design pedagogy is crucial for the development of both learning and teaching activities. However, there are a limited number of studies regarding this. In this study, we aim to bridge this gap

in the literature. This current study focuses on design conversation, which is the key interaction between design teacher and student within the context of design studio courses. To understand empathy inherent to design education, the indicators are traced in the content of teachers' design conversations considering how design teachers take the perspectives of others and what deliveries are utilised. The emergence of these pinpoints will help us to understand and conceptualise the empathic approaches of design teachers.

4.3 Eliciting Empathy Embedded in Design Conversations

Design conversations, which are the heart of a design studio course, are “the instances of one-on-one dialogue between a teacher and a student while presenting, reviewing, or working on a design project” (Ferreira, 2018, p. 16). Design conversations can be carried out in different ways and forms, such as one-to-one critique or individual desk crit, group critiques, informal dialogues, or formal reviews in design juries (Goldschmidt et al., 2010; Uluoglu, 2000). They are essential pedagogical venues (see Oh et al., 2013; Webster, 2006) for design learning and teaching as well as distinctive mechanisms as a communicative activity providing identity construction in design education (Adams et al., 2015; Uluoğlu, 2000). Design conversations between design teachers and students are especially varied and privatised regarding the content of the class, specific communication styles, strategies and tools developed intentionally or unintentionally, even personal characteristics, psychological factors, and pedagogical roles (Efilti and Gelmez, 2021). In this respect, the teaching styles and approaches of design teachers are the factors regulating these interactions in the design studio courses.

We have considered that design conversations based on design critiques and juries are prosocial behaviours and interactions in design studio courses particularly, which include the approaches consisting of reactions and responses to foster and develop empathy. Empathy embedded in design conversations is composed of cognitive, affective, behavioural, and moral components. Between design teachers and students, these ensure the development of mutual understanding, emotional congruence, and somatic movements enabling the constant rediscovery of the material through bodily knowing and being with the world (Skrzypczak, 2021). These enable teachers and students to adopt the perspective of each other, meet in the same cognitive state,

understand their thoughts and feelings, and respond accordingly regarding design representations, as well as carry the experiences of different stakeholders into the studio environment through simulations and imagination.

In this study, we observed several empathic indicators in design conversations. These empathic indicators, where design teachers identify themselves with another agency, in a word, project themselves into another position and identify themselves with the others, were pursued regarding our sub-questions:

- How do design teachers *take the perspectives of other agencies* in design conversations?
- What *delivery styles* do design teachers use during design conversations to invoke empathic perspective-taking?

4.4 Data Collection from Design Studio Courses

Adopting an ethnographic observational technique, participant observation enables “perceiving the activities and interrelationships of people in the field setting through the five senses of the researcher” (Angrosino, 2007, p. 37). Within the context of design education, ethnography has a significant advantage in investigating the underlying structure of the practices of design studio courses (Shaffer, 2003). In this study, we centre upon the embodied features of empathy in the practice of design conversations. In particular, we observed design teachers and analysed the content of their design conversations related to the research questions.

To reveal the empathy embedded in design conversations, we conducted participant observation studies in design studio courses at different levels and universities. As a method, participant observation enables field researchers to immerse in and engage with the design studio interactions. Researchers ‘pay attention to incidents, feeling tones, impressions, and interactions, both verbal and nonverbal’ by making decisions about the significance of the events, how to observe and what to collect. Then, they turn their experiences and observations into written texts, called field notes, which are the descriptions of what has been observed. Field notes help to elaborate and contextualise the research setting and provide rich information about the research content (Emerson, et al., 2011).

In this study, the first author participated in different design studio courses at two universities in Finland and Turkey. Even though the researcher conducted observation studies in both, she took different roles according to the research setting (Table 4.1).

Table 4.1 : The transparency of the method.

	Aalto University in Finland	Istanbul Technical University in Turkey
Department research conducted	Department of Design	Department of Industrial Design
Kind of method	Participant observation	Participant observation
Research setting	Ateliers	Studios and lecture hall
Position of the researcher	Researcher, Observer Outsider	Research assistant, Observer, Juror Insider
Conversations observed	Among design instructor, workshop master, bachelor and master students	Among design instructors, jurors, research assistants, bachelor students
Studio courses observed	Two different design studio courses	Four different design studio courses
Class participated	Four classes and 1 jury in total	17 classes and four juries in total
Teachers observed	One instructor, one workshop master	Eight instructors, five research assistants
Data collection	Field notes (during or after the course)	Field notes (during or after the course)

In Finland, she participated in design ateliers as a visitor. She was introduced as a researcher by the instructor of the course to the bachelor and master-level design studio communities, so she was able to position herself as an observer and outsider in the eyes of those individuals. Interactions between teachers and students were established in English and mostly in Finnish at this university. The researcher is a person who speaks Turkish and English and can interact in these languages but does not speak Finnish. Although she could understand the design critiques and interactions in English, she did not understand the contents of the interactions conducted in Finnish. At this point, she could only observe the body language of people. The researcher participated in two different design studio courses including the same instructor and workshop master. Four classes in different settings and one jury session, which usually lasted all day, were observed.

In Turkey, the researcher participated in bachelor-level design studio courses as a research assistant. She was more like an instructor, who was actively giving design critiques, so could be an insider in the full sense. She conducted participant observations during one semester in 21 classes, which lasted four hours each. Turkish interactions were established between the teachers and students at this university. The researcher participated in four different design studio courses including eight teachers and five research assistants. In total, 17 classes and four juries were observed.

In these settings, the formats of design conversations and interactions between design teachers and students were generally one-to-one and group critiques. However, the themes of design studio courses varied regarding different grade levels from material-based design to experience design, such as lighting design with cast concrete, desktop unit design with linear, planar and solid materials, workplace design for shoe shiners, food serving stand for traditional street delicacies, and developing public services through participatory approaches. These courses included several educational materials, user groups, stakeholders, and collaborations, thus the researcher was enabled to collect data from these different pedagogical and methodological approaches regarding the design learning and teaching.

In both settings, the researcher took field notes during or after the classes and juries regarding the research purposes. Deliberately, in-studio interactions, which include daily dialogues, other than the conversations of design critiques and juries were eliminated during the data collection process. While participating in the field and attending to ongoing interactions, it was not always possible to take descriptive and long notes in studios, but allowed to record “jottings,” which are “brief written records of events and impressions captured in keywords and phrases” and enable to “jog the memory later ... to recall the details of significant actions and to construct evocative descriptions of the scene” (Emerson et al., 2011). Instead of notebooks, the researcher jotted on her mobile phone considering its convenience and unobtrusiveness according to the day, date and observation period. The jottings were recorded in Turkish and revisited immediately after the classes were over (see Figure 4.1a).

These notes mostly consisted of textual narratives purposively compiled from 21 classes and five juries in total (61 hours of participation), which include the direct and short quotations from conversations between teachers and students and also the interpretive paragraphs of the researcher. The written data comprised approximately

6000 words and also included photographs from design studio environments as well as quick sketches of the researcher that depict particular interactions to remind.

4.5 Data Analysis

We conducted an ethnographic content analysis (see Altheide, 1987) for all our observation field notes. As a way of reflexive analysis of the collected data, analysis of ethnographic content is based on a constant discovery and comparison in the qualitative data to delineate conceptual categories and narrative descriptions regarding research objectives (Altheide, 1987). Instead of frequency reading, qualitative content analysis helps us to manifest the contextual meaning of the data through the systematic classification process of coding and identifying themes or patterns (Hsieh and Shannon, 2005) through a combination of concept-driven and data-driven strategies (Schreier, 2013). We utilised Atlas.ti software to code our data, which has been structured through the deep examination and interpretation of the researcher.

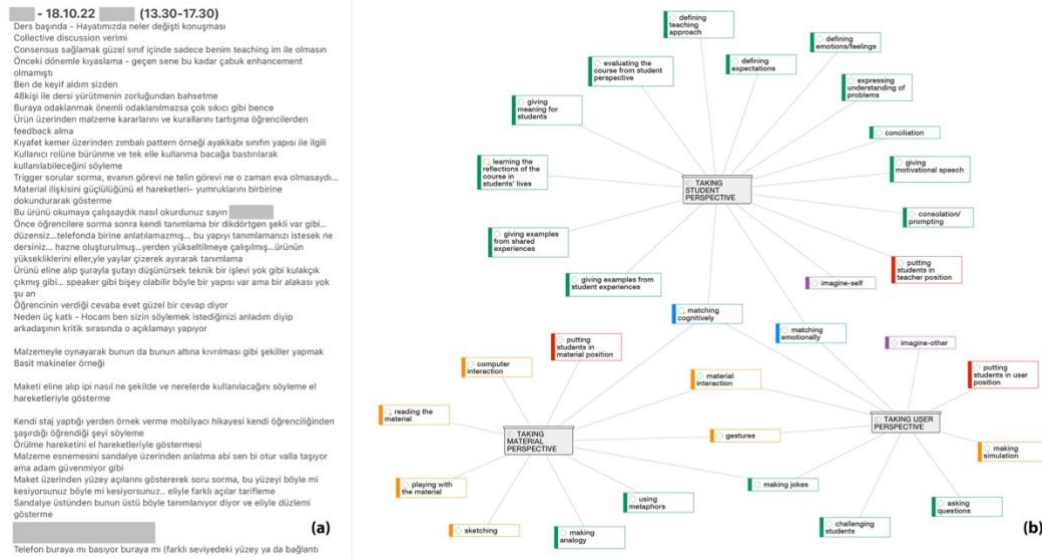


Figure 4.1 : (a) An example of jotting (in Turkish), (b) An example of data coding from Atlas.ti software.

The data were collected purposively. This means that the researcher collected only relevant data by eliminating the insignificant data instantly. By constant reading of the field notes, data segments containing a meaningful description regarding the field of inquiry were determined. In total, 290 data segments have been identified for further coding process. These have been associated with 32 codes 525 times. Codes have been grouped under broader themes regarding two empathic indicators traced in design

conversations. Three themes emerged around the empathic perspective-taking of design teachers (see Appendix F), which are taking student, user, and material perspectives (Figure 4.1b). Moreover, there appear two themes around empathic deliveries such as discursive and performative (see Appendix G).

4.6 Findings

In this study, we explored two main pinpoints, which are (1) the empathic perspective-taking of design teachers towards different agencies in design conversations and (2) the deliveries utilised by design teachers to invoke perspective-taking.

4.6.1 Empathic perspective-taking of design teachers

Based on data analysis, we found that design teachers take the perspectives of both human and non-human. Mainly, they identify themselves with design students, users, and materials. Although cultivating empathic interactions on different levels and having distinctive roles in design learning, taking the perspective of these agencies are the strategies embedded in design conversations to ensure cognitive and affective attunement regarding design practice (see Figure 4.2).

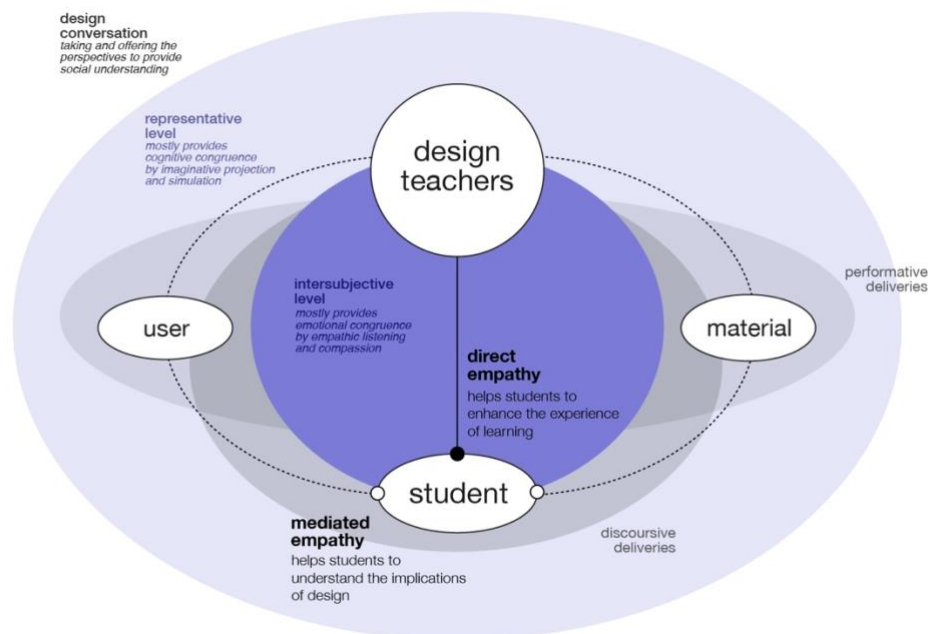


Figure 4.2 : Empathic perspective-taking of design teachers and deliveries.

During teacher-student interactions on an intersubjective level, design teachers can take the perspectives of design students and can establish empathy directly during design conversations. Moreover, design conversations have intrinsic components of design education at the third dimension, which are the user and material interactions occurring on a representative level. Taking perspectives of the users and materials through particular representations provides congruence between teachers and students. It is also addressed as a mediated way of establishing empathy among these agencies.

Moreover, design teachers are not solely taking the perspectives of these agencies but also demonstrating how and in what ways these empathic interactions can be established and offering them to students as a learning tool inherent to design education.

4.6.1.1 Taking the perspective of design students

On an intersubjective level, design teachers and students have verbal and corporeal contact during design conversations, which is based on an interactive process where both subjects are engaged. A design student shares the research outcomes, user-related findings, ideas, and drawings, and receives feedback. Deep listening, exchanging of ideas, criticising, and questioning are the significant communication forms of this social interaction enabling them to understand each other in decisions specific to the design process.

During design conversations, empathic listening allows design teachers to attune themselves to design students. Empathic listening, which represents the capacity to directly sense and connect with another subject, allows one to “see how the world unfolds through someone else's eyes” (Scharmer, 2013, p. 12). By exploring nuance, emotions and feelings related to students’ learning experiences, this perspective-taking level mostly intertwined with compassion and caring cultivates the emotional congruence of design teachers with students, which refers to direct empathy.

Our analysis shows that teachers usually imagine themselves in students’ place (imagine-self). This projection of design teachers mostly occurs as a sympathetic reaction to show a sense of “I understand you.” Therefore, particular statements can be used by teachers to show that the problems, difficulties and challenges the students face are recognized. They are followed by consoling, conciliation, normalising the problematic encounters, and giving motivational speeches regarding design practices

that prepare students for upcoming events. Thus, this empathic interaction has effects on the enhancement of the learning experiences of design students. To illustrate;

(The teacher talks about material limitations as) it is very normal for you to be offended when you are a student because there is only one material and glue is forbidden.



Figure 4.3 : The illustration represents a design teacher empathising with a student by recalling her own studentship experiences (Digital drawing by visual artist Nazlıcan Cevahir, April 2023).⁶

⁶ Inspired from the illustrations used in the work of Ilgaz (2009), the findings are also visualised by a visual artist based on the field notes of the researcher to better communicate the research setting.

In addition, design teachers may explicitly transpose themselves into design students' point of view via the projection of "if I were you." This shows how something could make sense if someone more experienced was in their place. To be better understood by them, design teachers may evaluate the course on behalf of students by taking a student's voice or transferring previous semester students' experiences by positioning them as peers. They may also make interpretations for students by giving examples from their own studentship, internship and work experiences as a former student, experienced graduate, and designer (see Figure 4.3).

(The teacher says that) if I were you, I would blame the teacher...

(The teacher says with the inner voice of the student) it's enough, I've done everything now, I won't do it anymore...

Design teachers may not only take the perspectives of students but also help them to identify themselves with their peers, users, and materials as a teaching strategy. In addition, they may also aim to help students identify with themselves by defining their concerns, and expectations regarding students' design processes and practices, and explaining to students what they want to achieve with a particular teaching method.

(The teacher says that) ... I'm trying to make you question whether we can look at this process from a more abstract point of view.

(From field note - 18.10.22 / Second-year Industrial Design Studio (13.30-17.30)) He tells the story of furniture production by giving an example from his own internship, putting himself in the place of the student and emphasising the places where learning will take place.

4.6.1.2 Taking the perspective of users

In the user-centred design approach, in order to design the product, service, interface, and system, design students conduct research to understand how users interact with that artefact, how they perceive and make sense of it (Krippendorff, 2006), and what their problems, concerns, dreams, and wishes are. These research outcomes provide students with meaningful insights and creative ideas. Within the design studio course, the students share these outcomes, insights, and ideas with design teachers during design conversations in a representative manner. The format of these representations can be written, oral, visual, or audio regarding the findings of user research, two and

three-dimensional idea exercises such as storyboards, sketches, prototypes, etc. We understand that design teachers can imaginatively project themselves in a user position through the representations, narrations, presentations and visualisations that students bring into the studio course as well as through their previous experiences regarding this user group. This role helps them to interpret the students' works from the viewpoint of this user (Oh et al., 2013). It is a mediated way of establishing empathy with design students through particular representations and this allows them to guide the students and the students' design practices with this understanding.

(The teacher says that) I look at it (the designed product) as a user, not as a designer or educator.

Teachers can imagine how users think, feel, and utilise the designed artefacts of design students (imagine-other) by putting themselves into user positions cognitively and emotionally. They use artefacts and make narratives about how they feel or think "as if" they were users themselves (Figure 4.4). Here, they not only facilitate the representations but also reflect the implied identity of the user in their minds, which is learned from previous experiences or interactions, and also speculate the users' behaviours by establishing empathy with them. It is a significant way to simulate and show students how a user gets to interact with their designs. In this context, the design teacher adopts a performative attitude. In this performance, the teacher intends to read the affordances of the designed artefact, in a word making sense of it from the eyes of the user. This way of understanding design also aims to give meaning to students through gestures.

(The teacher is narrating while using the product) I just pull the ice cream from there and I say it's like the ice cream needs to be served in a cold area... then it has to have a place of its own... I guess there won't be a cream filling when I'm going to do something like that.

(The teacher without saying anything) sits on the chair, he tries different leg positions and shows the position of his leg and where his back rests in the classroom environment, he moves on the chair and shows the different sitting styles to the class.

(The teacher says that) the user puts it there (showing on the product), would you say you wouldn't put it there, it's just there to show off the structure... I put it, for example...



Figure 4.4 : The illustration represents a design teacher using a student's design work as a user. In this way, she puts herself into a user position in a design studio environment through a student representation (Digital drawing by visual artist Nazlıcan Cevahir, April 2023).

This performance is accompanied by inquiring about the underlying justification of the students' decision-making by asking them questions and challenging the designed artefact. They animate the difficulties experienced by the users, the situations they have fallen into, and how the designed artefacts can be used differently than intended. During these performances, teachers mostly make jokes about the failures they faced to ensure mutual understanding with design students.

(The teacher says with the inner voice of the user) I don't know the structure, I did this at home, my child came and couldn't use it ... (showing on the product) then she came and threw it on my head ...

We can highlight that being able to take the perspectives of different user groups and stakeholders is related to the similarity of the design teachers with these communities. This identification can also vary according to the subject of the design project, teachers' experiences, ages, personal traits, etc.

4.6.1.3 Taking the perspective of materials

Beyond the anthropocentric understanding of empathy that centres its value solely on human connectedness, non-living agencies call upon empathetic behaviours through the lens of agential realism. This relies on the phenomenon of the ontological inseparability of interacting agentic capacities in which non-human animals, inanimate things, and humans (see Sinuefield-Kangas et al., 2022). In this study, we consider that design teachers make imaginative projections themselves to the educational materials, which are brought or produced in design studio courses, such as two and three-dimensional supplies, mock-ups, and prototypes. The progress of education through material interaction is an inherent feature of architecture and design education. In this study, we understand that teachers make identification with the materials regarding their forms, properties, behaviours, and responses, on a representative level. As opposed to attributing personal characteristics to material, it is an approach to materialising themselves.

Design teachers mostly use gestures and facial expressions, which embody their attitudes and decisions through body language, while materialising themselves. In architectural design studios, they are embraced as “architectural ways” of communication between design teachers and students (Mewburn, 2009). Gestures considered “invisible drawing actions” are significant communication modalities in design conversations that reduce the communicative burden of teachers' speech (see Larsson and Stolpe, 2022; Oh et al., 2013). Including symbolic functions, gestures convey meaning and appeal to the cognitive state of the addressee (Visser, 2009). Serving as a bodily representation of the source domain of a metaphor, gestures are “cognitive vehicles for connecting experience and abstract phenomenon” (Larsson and

Stolpe, 2022). They are not merely used for referencing or indexing to an object, but as a means of facilitating intersubjectivity in communication (Oh et al., 2013).

Finger, hand, and body movements help teachers project themselves into material positions and embody the speech on behalf of the material (Figure 4.5). In situations when it is difficult to verbalise, bodily movements occur in a way that reflects the behaviour and properties of the material. For instance, a teacher explains the height of the material by lifting his body with the shoulders and arms or describes the placement of the product by describing planes or creating forms with hand gestures.

(The teacher says that) there is a structure that actually provides a backbone structure, which gets narrower and then changes (the teacher shows it by touching the product with his finger)...

(From field note - 11.10.22 / Second-year Design Studio (13.30-17.30)) The teacher shows the form of the material with his own body: he shows the material to be upright by straightening his body... he shows how the product will stand at an angle by tilting his body forward and to the side... he describes how the material can be folded and bent with his arm, hand, and wrist movements.



Figure 4.5 : The illustration represents a design teacher materialising himself regarding the students' model and performing its features through bodily movements (Digital drawing by visual artist Nazlıcan Cevahir, April 2023).

While interacting and playing with the materials, teachers can narrate how they are making sense of them in order to show and describe to students how to analyse them designerly. Analysing the material includes detecting and interpreting the signs, which rely on making analogies between material combinations, connection points, form-giving, and the use of colour with examples from daily life. Moreover, we understand that teachers may prefer metaphors to clarify the material interactions.

(The teacher says that) we can see the harmony and compatibility of these materials as a good marriage...

(The teacher asks that) could this material combination be like cooking, like making soup?... If there are 4 ingredients, it starts with the first ingredient (material), then the second comes, then three and four...

4.6.2 Empathic deliveries used for perspective-taking

Design conversations consist of intertwined components of gesture, speech, and thought that often occur together (Davis, 2016). Analysis of the data shows that design teachers have developed different deliveries in design conversations to take the perspectives of other agencies. These deliveries can be clustered and discussed discursively and performatively. While discursive deliveries are based on verbal, perceptual, and emotional indicators, performative deliveries are based on physical, visual, and bodily indicators. Both serve the purpose of imaginative projection of design teachers toward human and non-human agencies; design students, users, and materials.

4.6.2.1 Discursive deliveries

Discursive deliveries involve the particular attitudes of design teachers in consolation, conciliation, and prompting students. To relieve students' emotional discomfort, teachers can motivate them by making jokes regarding problematic situations in design practice. Teachers' identification with students is significantly based on the connections they make with their own lives. They use examples from daily realities, their previous studentship and professional experiences, and also shared experiences with students. Design suggestions are made while putting themselves in a student

position. On behalf of the students, design teachers can evaluate the course and make sense of educational components.

They also identify design students with their peers to develop cognitive and emotional congruence. Peer experiences and design practices, especially how their design processes proceed and how they encounter and overcome the design problems, are transferred to make peer projection. To enable students to identify themselves with the user, design teachers can ask challenging questions regarding the usage and affordance of designed artefacts. We can also say that when students identify themselves with the user, their empathic awareness, cognitive development and emotional intelligence also increase. To place students in a teacher position, design teachers can explain their teaching approaches step by step, specify their expectations regarding the course, and define their wishes regarding the design practice and outcome. Moreover, to be attuned to them emotionally, it is understood that teachers talk about their feelings about the students' design processes, outputs, approaches, etc.

4.6.2.2 Performative deliveries

Performative means are based on enactments performed in a design studio environment. Gestures and mimics of design teachers are the key representations of these performances that usually emerge while taking the perspectives of users and materials. As a significant element of design conversation, gestures have clear differences in the types and variety regarding the stages of the design activity. We can say that design teachers mostly perform operational gestures, which explain the function and the use of a product, and deictic gestures, which refer to pointing at sketches, props, and notes, (Davis, 2016) while identifying themselves with the users. On the other hand, when they identify themselves with the materials, iconic and mechanistic gestures are frequently used, which refer to the formal and spatial representations involving the size, volume, and scale of the products (Davis, 2016).

To develop a kind of simulation in a studio environment, design teachers animate the users while making sense of the prototypes and drawings of the students. They take on the behaviour, thought, and emotional state of the user. Moreover, they embrace the features of materials considering their qualities, behaviours, forms, etc. Design teachers speak through materials while interacting with them. By playing with the

materials, the features are decoded and demonstrated. The aim is to explore the materials and give meaning to students.

4.7 Conclusion

This study centred upon comprehending empathy embedded in design conversations between design teachers and students within the context of design studio courses. Particular empathic indicators embodied in conversations were determined and pursued to explore (1) how design teachers took the perspectives of different agencies and (2) what deliveries were utilised for perspective-taking. By adopting an ethnographic perspective, participant observation studies were conducted in design studio courses at two universities and field notes were recorded from the conversations in design classes and juries. Data analysis showed that design teachers take the perspectives of human and non-human agencies, such as design students, users, and materials.

By internalising student perspectives, design teachers can establish empathy with students directly and comprehend their emotional states through verbal deliveries. On the other hand, empathic interactions between teachers and students can be developed mediately on the intrinsic components of design education, such as users and materials. Through the representations that design students bring in the studio environment, design teachers identify themselves with the users and materials to match cognitively with students. While the former has particular effects on enhancing the learning experiences of design students, the latter helps students to observe and understand the implications of design.

When we look at the delivery styles design teachers invoke for perspective-taking, they are grouped as discursive deliveries including verbal, perceptual, and emotional indicators as well as performative deliveries including physical, visual, and bodily indicators. Although this study does not aim to make a comparison between the two universities, we can say that due to the role of the researcher, the data from the university in Finland is mostly helpful in understanding performative deliveries and the university in Turkey is discursive deliveries.

Yet, this is a limited study based on observations conducted at two universities and involving situated teacher-student interactions. This research can be expanded and

elaborated by addressing different institutions that provide design, art, architecture, and technology education. Moreover, what kind of meanings or impacts can be created for students through the perspective-taking of design teachers is not included in the scope of this study. How the learning experiences and design practices of design students are shaped accordingly can be addressed in further studies.

Although this study primarily contributes to design pedagogy, we think that it can also be informative for the fields of educational studies and teacher education, as well as to studies related to empathy in the field of design research. We believe that exploring this implicit nature of design conversation will be a preliminary step to frame the empathic approaches of design teachers. Being aware of these perspective changes has an important place in improving the interaction and communication of design teachers with students in order to develop their pedagogical roles. This also helps design institutions to make pedagogical developments for the needs of students and to develop novel educational tools to fulfil the deficient aspects of teaching practice. Through following field studies, empathic interactions regarding design conversation can also be explored in detail by design education researchers, so both theoretical and practical models can also be improved.

5. DIGGING INTO THE EMPATHIC PERSPECTIVE-TAKING OF DESIGN TEACHERS⁷

This research aims to develop in-depth understanding towards empathic perspective-taking phenomenon in design teaching. A pedagogical probe study was utilized to obtain design teachers' insights behind adopting allocentric views by taking the perspectives of design students, users, and materials during design conversations. This participatory study enables design teachers and supporting teaching staff to actively contribute to the research process by self-documenting and reflecting on their teaching approaches. The findings show that perspective-taking of design teachers relies on distinctive teaching strategies, cultivated from intrinsic concerns and personal motivations, that spark motivation and inspiration of design students.

5.1 Introduction

Empathizing with the content component of others' thinking (Marathe and Sen, 2021), perspective-taking, is an embodied experience that one is looking at a system from that external entity's (both animate and in-animate) perspective (Soylu et al., 2017). Regarding the social competence to understand and identify with others (Galinsky et al., 2008), it "provides an intuitive access to possibilities of interactions with and affordances of other elements of the system" by predicting and anticipating events based on "ecological cues" (Soylu et al., 2017).

As a cognitive and behavioral facet of empathy, perspective-taking relates to the degree to which one can imagine oneself in others' shoes (Davis, 1983), including sensemaking and visceral responding. In the field of design, taking the perspective of users and stakeholders can help designers to incorporate human-centricity in their practice (Surma-aho et al., 2022). Designers are able to imaginatively transpose

⁷ This chapter is prepared in the format of an article entitled "Let's take a new perspective!: A pedagogical probe study for digging into the empathic perspective-taking of design teachers." It has been sent to the journal ANONYMOUS for consideration for publication and it is in-review stage at the time this thesis is submitted.

themselves into the perspectives of users (see Koskinen and Battarbee, 2003) by “self-displacing” or “self-othering” experiences (Thompson, 2005) through a range of activities including simulating, role-playing, storytelling, experiencing prototypes, etc. (see Kouprie and Sleeswijk Visser, 2009). To take users’ perspectives enables them to talk with them and immerse in their lives to cultivate an empathic understanding about latent realities (Li and Hölttä-Otto, 2022), as well as turns their experiences and emotions into inspiration for better design solutions (Koskinen et al., 2003; Mattelmäki et al., 2014).

Intertwining with human-centric approach and empathic mindset (Chou and Tversky, 2020), perspective-taking enables individuals to step outside the restraints of their own biases and allows them to engage in allocentric views by eliminating egocentric ones (see Ryokai et al., 2022). In creative processing, it is also framed as an approach including a “mindset on a meta-level” rather than a mind-wandering process. This approach helps with “problem-solving, forecasting, and social interactions as well as innovation” through overcoming fixation and guiding the search for new ideas by inspiring new stimuli (Chou and Tversky, 2020).

Perspective-taking is also tightly related to bodily and contextual practices as well as cognitive skills such as language and metaphorical thinking, thus plays an important role in learning (Soylu et al., 2017). In spite of the distinguished ways of perspective-taking in learning experiences that improve different performances, its broader form in learning refers to “all the attempts of one person to understand or perceive a situation in the way that another person understands or perceives it” (Tomasello et al., 1993, p. 510).

5.2 Perspective-taking of Design Teachers

In spite of the significance of perspective-taking in design approach and practice as well as the learning processes, this is a neglected phenomenon within the scope of design pedagogy (see Efilti and Gelmez, 2024b). In this study, we particularly focus on the perspective-taking of design teachers.

Within the context of design education, we have a thought-provoking interest to articulate empathy embedded in design conversations between design teachers and students including the dialogues and critiques related to design practice and process.

Intrinsic to design teaching, we associate empathy with perspective-taking of design teachers that is applied to congruence cognitively and emotionally with design students by engaging in allocentric views. Thus, we treat this phenomenon as a communication and a teaching tool, but a part of a more holistic empathic approach in design pedagogy.

Observations from design studio courses (see Efilti and Gelmez, 2024b) show that design teachers take the perspectives of particular agents during design conversations; design students, users, and materials. To provide a social understanding with students, they step in and out from these agents' perspectives. Taking student perspective allows teachers to congruence emotionally, which refers to direct empathy (see Efilti and Gelmez, 2024b). Besides, through the mediators of user and material representations in the studio environment, design teachers can identify themselves with these agents to congruence cognitively with students, which refers to mediated empathy (see Efilti and Gelmez, 2024b). Steering away from their own perspectives, design teachers can speak with their voices, use, and interpret the designed artifacts accordingly. By this way, students are able to “see their design from different perspectives compared to only the egocentric perspectives” (Ryokai et al., 2022) of design teachers and themselves. Perspective-taking occurs spontaneously and intuitively in the natural flow of design conversation. Depending on a complex and ongoing process, it is shaped by actors' cognitive abilities, underlying motivations, employed strategies, cultural and situational factors, etc. (Gehlbach and Brinkworth, 2012).

The objectives of this current study are to delve into this research phenomena through a phenomenological perspective, which concentrates on the perceptions of people regarding experiential and lived aspects of a particular construct and the meanings in the subjective experiences (see Nelson, 2011). Aiming to explore the insights of perspective-taking in a self-reflective way, we believe that we can discuss the empathic pedagogical approaches of design teachers in a multidimensional way.

5.3 The Research Design

Considering the previous field studies (see Efilti and Gelmez, 2024b), participating in design courses as an observant and a researcher can be challenging practically due to the inability to be involved enough or disrupting the environment and experiences. As Gaver's definition, to avoid the “understood social roles of researchers and

researched,” (as cited in Hemmings et al., 2002), this study is based on a probing approach that enables design teacher participants to become the researchers of their own teaching by self-documenting their own perceptions, approaches, and practices. It is a designerly approach to research (Mattelmäki, 2005) which is a familiar tool, creating a common language for designers and design teachers (see Celikoglu et al., 2017). This study aims to provoke design teachers to think about their perspective-taking during design conversations, to interpret their own motives behind this phenomenon, as well as to increase their awareness about perspective-taking and reflection on design studio practices.

Probing as an activity and a research approach, which covers “a broader co-design discourse” (Dankl et al., 2023), has its roots from Cultural Probes (Gaver et al., 1999), Generative Toolkits (Sanders, 1999), Design Probes (Mattelmäki, 2006), and Context Mapping (Sleeswijk Visser et al., 2005; Stappers and Sanders, 2004). Relying on self-documentation, probes purposefully sensitize people to observe and enable them “to reflect on and verbalize their experiences, feelings and attitudes, and to visualize their actions and contexts” (Mattelmäki, 2005, p. 83) through various kinds of descriptive and exploratory tasks (Mattelmäki, 2008).

Some traditional probes involve kits made up of physical objects and accompanying materials, such as diaries, maps, postcards, disposable cameras, etc. (Gaver et al., 1999; Mattelmäki, 2006). In this digital age, communication technologies and devices like personal computers, tablets, and smartphones, as well as today’s informal online media like website, social media, apps, and email are also adapted for probing activities to send and return tasks between researchers and participants. These online probes usually consist of similar open-ended “evocative tasks,” but generally not the physical objects and materials (Golmohammadi, 2022).

This current study (see Appendix H) is based on the development and the implementation of an online probe (see Figure 5.1a). Google Forms platform, adapted for this probe, is a web-based platform with no required special software or application download, directly opens on web browsers, so can be used on both a mobile and a computer. The reasons for the deployment of an online tool are to have easy, convenient, and quick access to participants in different learning settings and conduct the study synchronously, as well as to adapt the study to the daily life dynamics of the participants easily. The interface of Google Forms platform is familiar for the

participants and allows easy and quick writing experience, simple upload of photos, videos, and voice records.

Aiming to involve design teachers into the research process, provoke and empower them to open a dialogue with them and gather subjective information regarding research objectives, we can say that the information orientation (Mattelmäki, 2005) of the probing approach is in the foreground in this study rather than its artistic characteristic.

5.3.1 The content of the probe

The study consists of six forms, which are an invitation form (see Appendix I) and five-day long study (see Appendix K-O). The invitation includes information about the aims of the research and how to carry out, the overview of the researcher, how the anonymity will be provided, fellowships and ethical committee approvals for the study, as well as a consent form that participants indicate to volunteer for the study. When the participants agreed to participate, they indicated their preferred communication channel, in addition they filled in their occupational information, which includes department and teaching experience info and details about their ongoing design courses in the invitation form. When a participant confirmed the participation and submitted it, the participant received the first link including the first day's tasks and questions in the next day. Each day of the probe study was designed as a separate form, and these were shared with the participants day by day via their preferred communication channels. Via this method, it was possible to kindly remind participants of the daily tasks during their long and intensive days.

This probe is deliberately designed with the pedagogical tasks and inquiries hinged upon both an imaginative design project scenario and ongoing design studio practices (see Figure 5.1c). The stages and content of this pedagogical probe (PP) were developed to explore the motives and drivers behind empathic perspective-taking of design teachers holistically towards design students, users and materials. While developing the tasks, assignments, and inquiries, a pilot study was conducted with three supporting teaching staff from industrial design departments. In these pilot studies, the probe content in different inquiry formats was carried out. This helped us to understand which type of pedagogical inquiry availed for our research objectives and which wording did not make practical sense. The tasks and assignments of the

probe days were reconsidered in this sense in terms of understandability and easy documentability. Moreover, participants delivered their reviews about the content of the study as peers. Accordingly, the content on how to obtain participant evaluations and reflections was revisited.

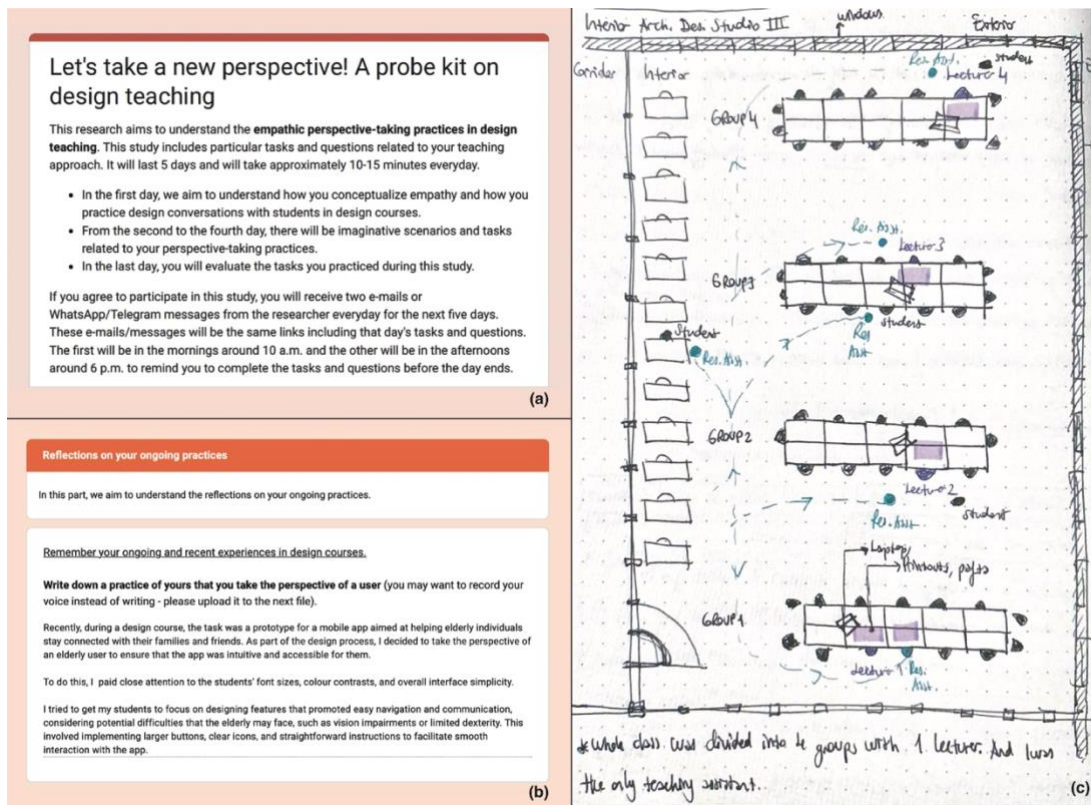


Figure 5.1 : (a) The invitation interface of the probe study, (b) a reflective writing of a participant, (c) a design studio drawing uploaded by a participant.

The pedagogical tasks, assignments and inquiries in the probe study are devised from general to more specific and critical. To exemplify, the first day includes a drawing assignment to understand the ongoing practices of design teachers in design studio courses and both human and non-human agents situated in design conversations generally. In addition to this, there are gap-filling tasks to explore how participants conceptualize empathy and perspective-taking within the context of design education such as in design studio and during design conversation. By these assignments and tasks, we aim to discover the inner dimensions regarding the perspective-taking phenomenon.

From the second to fourth day, the pedagogical exercises and tasks hinge upon an imaginative design project scenario to prompt participants to discern their own pedagogical approaches regarding perspective-taking and to reflect on these in an

interpretive way (see Figure 5.1b). The imaginative design project scenario, which relies on a design conversation with a design student, is prepared by the authors regarding the collected data (Efilti and Gelmez, 2024b). It is expected that the participants immerse themselves in the scenario as design teachers running the course and identify themselves with different agents in the scenario respectively: a design student (exercise of Day 2), a child user (exercise of Day 3), and a 3D model (exercise of Day 4). From these agents' perspectives and voices, participants are expected to give design critiques to a student mentioned in the scenario. They are steered to think about what they would say and how they would act during this design conversation. Herein, the interface of the probe study enables participants to write or record their design critiques and performances. Then, there are open-ended inquiries to capture the reflections of participants on the intentions and motivations behind perspective-taking, and the impacts on students' learning processes. After these sensitizing practices through imagination, design teachers are expected to recall and document the similar practices in their design education experiences. Moreover, as a task, participants are supposed to give pedagogical advice to their peers on how to take these perspectives in design conversations. Via these exercises, we aim to understand the embodied dimensions of perspective-taking of design teachers.

Lastly, on the fifth day, there were rating questions for participants to evaluate their own teaching practices regarding perspective-taking towards students, users and materials. Those were centered upon the ease of adopting the perspectives, their frequency of use in daily conversations, their potential contributions to learning as well as their efficacy to enable an understanding with the student in design conversations. In addition to this, there were open-ended inquiries regarding their experiences of probe study. By this way, we aim to comprehend the evaluation of participants for this study and their reflections regarding their own teaching approaches.

5.4 Data Collection

This study, which includes a pedagogical probe (PP), was conducted with the participation of design teachers and supporting teaching staff, who are doctoral researchers, teaching or research assistants in higher education. Purposeful and snowball sampling (see Tracy, 2013) were used to reach and recruit the participants. The design teachers and supporting teaching staff, who are conducting or co-teaching

a design studio course, were invited to participate in the study. Herein, design studio refers to the practice-based learning environments called workshop, atelier, lab, course, project, etc. The courses relied on active design conversations between students and teachers, user-centered design and material-based projects were also included in the scope of this study.

Among 22 invited people, 15 of them (see Appendix P) volunteered to participate but two participants (P9 and P13) were not able to complete all the tasks. The study lasted a total of three months. The courses they were running varied from Basic Design, Industrial Design, Ergonomics and Human Factors in Design, Form Theory, Product Analysis to Graduation. The topics of projects in these courses were also varied such as a DIY cat bed made of corrugated cardboard, electrical home appliances, visual and structural explorations of various physical materials, team project on a hand operated device that uses a given ceramic filter, etc.

5.5 Data Analysis

A directed approach to qualitative content analysis (see Hsieh and Shannon, 2005) was conducted for the textual data including writings, drawings, and voice records submitted by the participants. It is a systematic process of coding with an existing theory or relevant research findings about a phenomenon with the aim of validation, corroboration, refinement, or extension of a conceptual framework (Hsieh and Shannon, 2005). The analysis process based on the re-reading of the materials interpretatively and reflexively has a preparation phase including “developing the study’s framework” and “determining the data units;” an analysis phase including “coding and organizing the data; making connections, interpreting them, and drawing conclusions,” and a reporting phase based on “making a thick description of the research process and findings” (see Kibiswa, 2019, p. 2066).

Aiming to extend the conceptual frame of empathic perspective-taking of design teachers as well as explore the perceptions and practices around this phenomenon, we coded data regarding a “coding agenda” developed from the previous research (Efilti and Gelmez, 2024b) (see Appendix R). This basically includes codes related to perceived empathy, the practices of empathic perspective-taking, and the motives underlying these. New codes and (sub)categories are also created.

In a deductive way, the categories of coding agenda was determined from general to specific as the content of probe study. Initially, the participants' conceptualisations of research concepts were determined under the category of "the conceptualisation of empathy in design education." The perspective-taking of design teachers in design conversations towards design students, users and materials were also defined as three predetermined categories (see Efilti and Gelmez, 2024b). The data units, which were the quotations of participants, were associated with these categories, then merged under a broader category of "the perspective-taking during design conversations." Depending on the research of interest, another predetermined category was "the motives around perspective-taking" that covered the subcategories of the intentions and the personal motivations behind perspective-taking as well as the potential impacts of perspective-taking. Then, the coding of the data units was carried on under these broader categories to organize the data.

5.6 Findings

5.6.1 Conceptualisation of empathy in design education

Data analysis shows that participants tend to associate empathy with affection, sensitivity, bond, connection, in-between sympathy and compassion, tolerance, and understanding, in a general manner. They also define that empathy in a design studio (workshop, lab, course, etc.) correlates with tutor-student and peer interaction, responsibility, attentiveness, positive atmosphere, creating a safe space for students to share their learning experience, equal say, openness, positive experience and approach to failure, recalling when they were younger/student, taking distance from the role as an educator to assume the role of a designer of the learning experience, "*perspective-taking, walking in user's shoes, and an anticipation of the user's experience with the designed product*" (P2). They also frame the features of empathic design conversation between teachers and students as compassionate and constructive feedback via asking questions rather than judgmental statements, trying to understand the challenges of students while conducting the project, being supportive, (really) listening, encouraging, and motivating.

5.6.2 Perspective-taking during design conversations

Participants drew their recent classroom plans and indicated both human and nonhuman agents affecting their design conversations with students. In this task, most of the participants indicate that they put themselves in the places of both human and nonhuman agents during their design conversations, such as students, peers, stakeholders, manufacturers, users, target groups, animals, stakeholders, environments, mock-ups and models, other teachers and designers, while some define that they have trouble identifying with anything nonhuman. Within the context of this study, we particularly center upon the perspective-taking of design students, users, and materials as well as approaches around these practices according to previous findings.

I put myself in the shoes of the users... in the interior projects, I walk in those spaces and try to live in them... I also could put myself in the place of the product... If I were a robot vacuum cleaner, I might be imagining where and how I would travel... - P4

Supporting the preliminary study (see Efilti and Gelmez, 2024b), participants' narratives highlight that taking a student perspective during design conversation helps design teachers to understand what kind of support students need, to boost their emotional state regarding the design process and to heal the negative learning experiences through motivating, empowering, consoling, "assuring them it is even expected to struggle" (P2), and highlighting the positive aspects of the project. In design critiques, they are doing these by asking indirect questions to avoid deciding for the student but pointing out some insight and giving some clues, as well as presenting different ideas and encouraging them to produce alternatives.

I would emphasize that trial and error is a natural part of the process... I would tap on the shoulder and say it is completely OK to get lost sometimes because the design process is messy. - P2

My approach would be conversational. About the previous unsatisfactory work... sometimes you learn even more from the unsuccessful work and learning is the important thing. Also, the feeling of inadequacy is a rather common feeling and accepting the fact that sometimes you fail is part of growing to be a designer. - P7

Participants' narratives also show us that design teachers can imitate users in design courses to stimulate discussions on user experience. This role-playing enables design teachers to understand the designed artifact from the perspective of the target user

group and to demonstrate user experience and the features of the designed artifacts for students. Some participants remark that they use the voices of the user during design conversation. Aiming to make students think about and imagine the user's world, they also ask direct and most detailed questions about the daily life or perceptions of the target. Some share the witnessed experiences and stories about that target user to represent possible best and worst scenarios for students. The bodily performances of design teachers may also become different rather than being a teacher. A participant (P3) mentions that his bodily performances would be more curious and dynamic in understanding the pragmatic aspect of the product when he steps into the shoes of a user.

I would even show signs of frustration in a mini role play and throw everything on the table if it doesn't work. I could also ask the student to engage in role play by pretending to be in class and try to find a specific item in the pencil case. - P2

As a child of 7-10 how big are my hands... in what detail do I use and interact with objects? How would I use a zipper, what should be the size and shape of the zipper handle? ... And similar comments where I and with me the student could imagine being that child. Going through each step of interaction with the object as that child... storytelling is quite helpful. - P6

The imaginative design conversations of the participants also show that taking a material perspective enables them to emphasize and express how the form of a material would behave. They define that they try to imitate the material, model, or sketch regarding its types, properties, or behaviors. To represent the actions of that artifact, they demonstrate the representative movements with their hands, bodies, and mimics. They can bend their bodies to represent a folding action, twist their bodies to represent flexibility, or “show physical similarities like showing a bodily joint... like a wrist or an elbow to imitate the connection points of objects” (P6). It is understood that they also try to feel the authentic features of the materials like being soft, plastic, etc.

"These zippers do not want to open. They are having a hard time." To describe the tightness of the materials inside, especially the pencils, I would probably use expressions such as "it's very narrow in here" by bending my arms and bringing them closer to my body. - P1

I can imagine myself trying to bodystorm the resistance of the material in the opposite direction, and deforming the mockup from the lengthy zipper, twisting and even tearing a bit up.- P2

5.6.3 The motives around perspective-taking

5.6.3.1 The intentions behind perspective-taking

Design studio interactions between teachers and students based on a “countertransference” can become complicated due to personal studentship experiences of design teachers. If design teachers have experienced catastrophic design conversations in the past, they may believe that this toughness is necessary for everyone and “can only be assuaged by inflicting similar pain on others” (Ochsner, 2000, p. 202). As opposed to this, according to participants’ narratives, their basic aims based on taking a student perspective are empathizing with the students by reminding them that they are not alone and what they experience during the design process is normal. For this, they are dealing with the students’ anxiety and frustration to help them to create a new attitude for learning, guiding them to a better design process without traumatizing, helping them to explore alternative ways of achieving the same task, leading them to achievement, showing them to “*how to think in a designerly way*” (P6), and encouraging them to trust to their thinking to build a creative confidence.

I would try to make the student feel calmer and that everything is fine, so that the student does not feel like "I couldn't do it again." Because when I was a student, I experienced that feeling of inability and failure a lot... I do not want to be the person who makes him experience this feeling of lack of self-confidence and failure - P4

The primary reason for a design teacher to take a user perspective during a design conversation is to show students which details to think of about the user and the object in terms of user interaction. A participant (P11) interprets this practice as a “*stand in the user's side instead of me-side,*” so it helps them to get out of their own bodies and minds. Participants often mention that they demonstrate how a target user interacts with the designed artifact of the students in an exaggerated way. During these demonstrations, they waggishly challenge the design decisions of students and represent how this design connects with the user with fun and curiosity. These demonstrations enable design students to observe and identify the problems during interactions as well as help to bring different situations to the table and make the

student think about how their design should be easy to use by a target group and create positive and safe experience.

I decided to take the perspective of an elderly user to ensure that the app was intuitive and accessible for them... I tried to get my students to focus on designing features that promoted easy navigation and communication, considering potential difficulties that the elderly may face, such as vision impairments or limited dexterity. - P8

By taking the perspective of a modeling equipment, a model, or an object, design teachers are able to demonstrate students the relationships, relevance or irrelevance between material and form. This approach aims “to show students that objects are physical entities and have very similar properties like any other body, including ours” (P6) and calls attention to the features students may be ignoring about the model. Aiming to encourage students to question, representing a material perspective can make students reconsider their approaches and can open alternative doors.

Sometimes students don't realize the model is "talking back" to them, and they are not listening. So, sometimes I try to make the student "see" what she hasn't seen yet. - P8

5.6.3.2 The personal motivations behind perspective-taking

When we examine the motivations to take the perspective of a student, most of the participants highlight the shared experiences and challenges faced by themselves and the students as designers. Experiences of participants as former students, professional designers, observers, and teachers help them to identify themselves with a student.

Very recently, I was one of those students... I can say that the difficulties I encountered in design education... For this reason, looking from the student's perspective can be a little more effortless. - P10

The motivations for user perspective-taking are based on design teachers' own experiences as users. Students' user research and findings can also lead the demonstrations and interpretations of design teachers. In addition to this, their academic background, teaching experiences, daily life observations regarding the target user shape these practices. One of the participants (P3) also highlights that his previous empathic and emotional relations with that user group stimulate to take that user's perspective.

My academic background in methods of designing for child users :) - P2

I would use my experience as a father of two small kids. - P8

The important motivation for design teachers to take a material perspective is dealing with a lot of physical objects and mockups as a former student and current teacher and being in constant observation mode in daily life as a designer. This helps them to consider the physical properties and various parts of the artifacts. A participant (P4) mentions that she can easily put herself in an object position owing to her designer ability enabling to detect weak relationships between material and form. Depending on the product and material itself, design teachers can analyze and mimic the movements and sounds of the materials.

Not all materials are meant to be bent or crack but, in this scenario, a hard, sheet material, it works. Mimicking sounds the material would make when forced (cracking?), or auditory feedback like attaching two parts (click?) - P2

5.6.3.3 The potential impacts on learning processes

The design teachers also mention the impacts of the design critiques from the perspective of a student on the learning processes are “*somewhere between the feeling of support, trust and independence*” (P2). Feelings of “you are not alone” and “you can do it” with all these challenges and problems can increase the commitment of students to the project and learning activities, and they can “*feel motivated to continue to explore in a deeper level, connect with the topic from a personal and nuanced point of view*” (P12). It is believed that these can help design students to develop their design competences and make their design skills more sustainable, to check their biases, to open them to explore different and new ways to eliminate difficulties and consider various criteria together.

I observed that it was good for the student to hear that the instructor went through similar processes... I said things like "other students also experienced things like you, they did this and progressed like this", and I observed that this gave the student the feeling of "I am not alone" and relieved her a bit. - P1

The design conversations from the perspective of a user also help the students to look at the user context very critically and more over the pragmatic and psychological needs of the user. “*Basically, students should realize that they design not for themselves for the real use of whom they have very little*” (P3). Thus, this has not solely impacts on their instincts, but also “*filtering every design decision through a user filter...*

especially when stuck in ideation, refers to the user experience to take reference for major design directions” (P2). Some participants also indicate that their demonstrations and interactions, especially with mock-ups, can encourage students to think from the perspective of the user.

Participants believe that giving a design critique from the perspective of a material promotes the student's learning thought process. This helps students to evaluate the designed artifacts in every aspect. Such an application also makes students think about the problems by approaching from the perspective of a material, which is generally approached by the human-centered perspective. A participant (P2) emphasizes that adopting the perspective of a prototype creates *“a mental image of the material and form, and being able to manipulate it mentally to anticipate how it would behave.”* As future designers, it is also very significant for students to enrich their designs sophisticatedly by *“taking into account all stakeholders, human and non-human elements (actors and agents) in the design process” (P4).*

5.7 Participants' Reflections on Perspective-taking

As a purposeful action of thinking and drawing meaning from it, reflection allows individuals to revisit and comprehend the action (see Schön, 1983), as well as to recognize its underlying reasons and intentions (Marathe and Sen, 2021). In the field of education, reflection *“will enable the teacher to build a better student-teacher relationship, and also have an unbiased, critical and holistic understanding of the situation”* from a lens of empathy (Marathe and Sen, 2021, p. 566).

According to the participants' reflections on their practices during this study, taking a student perspective occurs in a self-regulated way due to the design teachers' familiarity with studentship experiences and continual relationship with students. All three of these perspective-taking types contribute to having an empathic understanding with design students at different levels. However, for most participants, looking at the project from the student's perspective makes them more empathetic. It can be better understood where students had difficulty and why, what they missed, or what they aimed for. But it is a bit less obvious for students to realize that teacher-participants take their perspectives during design conversations, it is more apparent when they talk from users' and objects' perspectives.

Adopting a user perspective can also be a bit trickier because most of the participants define that they do not have access to them all the time and user's experiences are subjective. Based on their own teaching experiences, the participants frequently take user perspective in their design conversations compared to others owing to the requirement of addressing user needs. It is also thought that this will make the most important contribution to the student learning processes by going beyond his/her own perspective. Besides, taking the perspective of a user and making it explicit aims to foster this habit, as students are supposed to take the user's perspective independently in their professional lives.

Moreover, taking a material perspective is defined as challenging by most of the participants, even sometimes impossible in a virtual setting. Compared to identifying with non-living things that require a new set of thought processes to visualize, associating themselves with a living thing is easier for the participants. Thus, it is the least frequent perspective used during design conversations of participants. However, it is emphasized that this way of thinking process is crucial, especially for product design. It helps students to take out their comfort zones, so as to develop an understanding and critical perspective in terms of material-form relations.

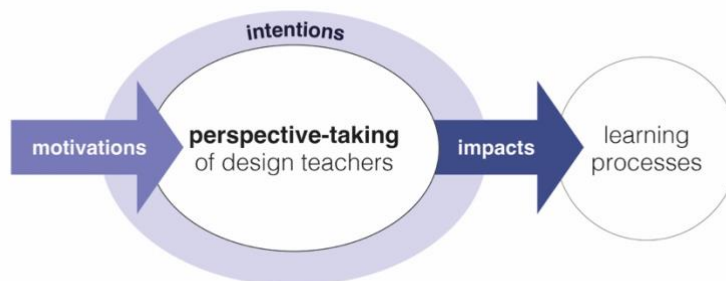


Figure 5.2 : Perspective-taking of design teachers.

5.8 Discussion

As an inherent and intrinsic to the design conversation, perspective-taking of design teachers serves for bringing an alternative attitude for students and their design process (see Figure 5.2 and Figure 5.3). Taking a student perspective during design conversations is mostly related to caring and emotional support to improve their learning experiences and encourage their commitment for learning. This practice is cultivated from their shared experiences and challenges in studentship and

professional lives. Thus, design teachers can more directly and easily establish empathic understanding with students who are closer to their own past student and designer identities. However, taking the perspectives of users and materials are carried out through mediaries as user models, representations, prototypes, etc., in order to make a designerly way of sensing user and material worlds. These practices make explicit for students how design teachers interpret “Otherness” (see Krippendorff, 1996) in design conversations and incorporate it in the design process for inspiration. As we understand, the “familiarity” and “relatedness” (see Airenti, 2015) of design teachers is the crucial factor for taking a user perspective. The more similar experiences or lifestyle one has with a user, the easier it may be to take on that role; however, it might bring more biases about that user. In addition, two- and three-dimensional artifacts are nonhumans that act and participate in the social system (see Latour, 1996) of design education. Taking the perspective of a material or model aims to expand the thinking horizon of students. Constant observations in daily and professional lives as well as disposition of material-specific and morphological interpretations lead this practice.

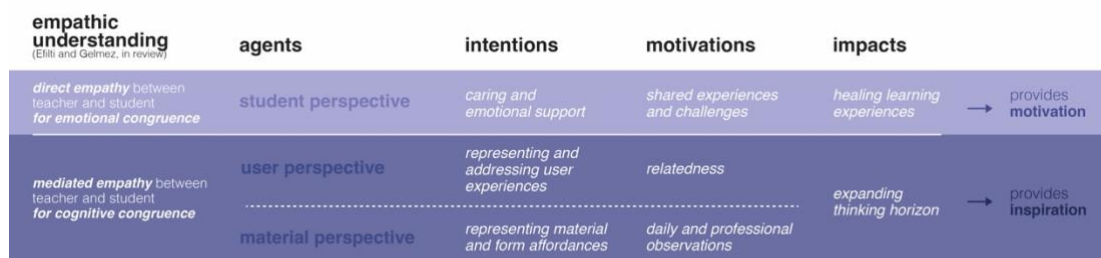


Figure 5.3 : Holistic view on perspective-taking.

5.9 Towards New Pedagogical Tools in Design Education

Each design teacher has implicit motives behind perspective-taking, so the aim of pedagogical probe (PP) is to create a common ground for self-reflection of the participants from different teaching contexts. Aiming to sensitize and provoke design teachers to think about their own teaching approaches through imagination, the findings show that imaginative projection helps to cultivate their situational awareness towards their own teaching and pedagogical role. Some participants stated that this was an interesting and engaging process for themselves that includes enjoyable phases. They also emphasize that they critically think about their own design conversations,

so they are aware of their approaches, bodies, gestures and how layered this practice actually is. Some state that this study opened a different viewpoint to look at empathy and perspective-taking deeply and that it also reflected on their own design studio practices.

As a self-reflective tool, this study prompts participants to think about their own teaching approaches. Being critically aware of these practices can help design teachers to transform their teaching capabilities and improve their pedagogical approaches in the quest of a more empathic design education. We also believe that the interpretation of the probing approach in a pedagogical sense will provide a new perspective for researchers. Relying on self-documenting, this method can solidly be developed as a toolkit to empower the pedagogical implementations of design teachers in further studies. The findings of this study can also help scholars and researchers to develop particular educational exercises for design teaching staff, such as pedagogical games, workshops, group interviews, etc.

Moreover, group interaction and discussion spark a greater connection and lead to increased understanding (see Kouprie and Sleeswijk Visser, 2009). Beyond self-reflection and awareness, this study emphasizes the need for a collective discussion and knowledge creation of design teachers regarding taking the perspectives of different agents. Thus, the tasks of the study and signature methods can be cultivated for peer-reflection. According to the evaluations of participants, the research process can be condensed, more entertaining tasks and experimental artifacts can be included. It also shows that a probing approach in design teaching opens a new space for designing physical instruments for a pedagogical research purpose.

5.10 Conclusion and Further Studies

This study aims to comprehend the underlying motives behind empathic perspective-taking of design teachers that allow them to engage in allocentric views during design conversations. It takes a look at design conversations, the heart of design education, by addressing it via perspective-taking practices. A pedagogical probe (PP) study was conducted with the participation of design teachers and supporting teaching staff. Findings show distinctive aims and drivers embedded in perspective-taking practices that serve for the designerly way of thinking and enhancement of learning activities, the motivation and inspiration of design students particularly.

There are particular limitations in this study. The most important was the absence of the student perspective and voice. In further studies, the voices of design students regarding perspective-taking and the reflections of these practices on their own learning processes can be addressed. During the study, we also neglected the gender of the participants and imaginary students. However, the genders of both parties may affect these practices.

Moreover, according to some participants, the research process is long and repetitive at some points, considering the time schedule and intensity of the tasks. They have some concerns about immersing themselves into the imaginative scenario, so being in a face-to-face and spontaneous interaction of the design conversation could give a different opportunity to clarify several aspects of perspective-taking as well as have enabled them to develop different awareness.



6. CONCLUSION

This thesis is carried out in regard to the rules and regulations established by Istanbul Technical University Graduate School for the doctoral thesis out of at least three published scientific articles (LEE, 2020). Each chapter represents a publication that contains sections of detailed discussions and conclusions on the results and findings of each step taken within the scope and aims of this thesis.

In this chapter, both conceptual and practical implications of the thesis are delivered. The research objectives are revisited via the synthesis of the research findings. In this part, how each publication connects with each other are also explained. Following these, the concluding remarks including the limitations of the study and the recommendations for further studies are presented.

6.1 Implications of the Study

In this section, both conceptual and practical implications of this study are addressed. Firstly, how perspective-taking of design teachers as an empathic action in design conversations is discussed from different contexts. Considering the important drawbacks of empathy, different traps that teachers may fall into on the way of taking a perspective in design conversations and the disruptions on learning experiences are also addressed. Then, how this study provides the development of practical pedagogical tools and exercises at personal, collective, and institutional levels for design teachers, researchers and institutions in the quest of empathic design education is presented.

6.1.1 Conceptual implications: Perspective-taking as an empathic action in design conversations

Within the conceptual frame, a discussion regarding the embodiment of empathy in the design studio requires to be carried out through synthesising the deliverables of the studies. Within the scope of design education, the phenomenon of empathy embedded in design conservation is associated with perspective-taking to ensure cognitive and affective attunement between design teachers and students regarding design practice.

Thus, perspective-taking of teachers is framed as an empathic component of design conversation as a conceptual implication of this study.

Perspective-taking coordinately activates both self (first-person) and other-person (third-person) experiences, which are the basis of empathy (see AIRENTI, 2014; GALLESE et al., 2004). Perspective-taking performed in design conversations enables both parties adopting allocentric views of the significant agents of design education as well as developing an empathic understanding, which refers to cognitive and affective congruence between teacher and student regarding design. From the side of design teaching, these practices have been defined as one of the empathic approaches of design teachers within the context of this study. Empathic approaches of design teachers, as in pedagogical roles, are variable according to the personal characteristics and psychological factors of teachers, their communication styles, strategies and tools (GRASHA, 1996). Moreover, the previous studies show that these variables may differ on a scale depending on the background and pedagogical styles of teachers, their expectations from the students, what the project is, at what phase the project is, in which grade it is, etc., so perspective-taking practices as well.

Within the context of this study, perspective-taking of design teachers during design conversations are examined towards three prominent and predominant agents, such as design students, users, and materials. As mentioned (see Chapter 4 and 5), perspective-taking of design teachers in design conversations towards both human and non-human agents can rely on various motivations, include distinctive purposes, so may produce different impacts on the learning processes of design students.

6.1.1.1 Empathic perspective-taking as a prevention for traumatic impacts during design learning

Ochsner (2000) has brought a new perspective to design education and student-teacher interaction from the psychoanalytic context. The design studio interaction between design teacher and student centres upon the “play space” that is shared by both parties (see Ochsner, 2000). Herein, the aim is to enable students “to play with their design ideas—to develop a process where they can access the transitional realm and can bring together the external reality of the physical and the internal reality of the possible” (p. 198). These perspectives as a whole are demonstrated and offered to design students to help them to internalise the design process itself, to think in a critical and designerly

way, and to engage them in a kind of “creative play” with design and possible design solutions (Ochsner, 2000).

During design conversations, it is understood that perspective-taking towards students relies on the accumulation of knowledge and practices of teachers developing out of their academic, industrial, and daily life. Ochsner (2000) addresses the “transference” phenomenon from psychoanalysis within the scope of the design studio interaction in relation to the impacts on the development of an individual as an important figure, which has a facilitating or inhibiting force. Therefore, design teachers' studentship experiences and the approaches they see and learn from their own teachers are the heritage of their teaching activities and empathic approaches that may also shape perspective-taking practices. These can positively guide or wickedly complicate their interactions and relationships with students “by what psychoanalysis has identified as countertransference” (Ochsner, 2000, p. 202).

In general, design studio is an experience that design teachers have already gone through. As is known (see Chapter 4 and 5), design studio teachers highly likely identify themselves with their students when they observe things similar to their own experiences in students' design processes (Ochsner, 2000). To exemplify, design teachers struggled with a sort of issue when they were students; therefore, they can identify themselves with the frustration and anxiety that the student is feeling. Thus, they can take the perspectives of students automatically.

Perspective-taking of design teachers during design conversations towards students can also be cultivated through the ongoing acquaintance and interaction between these agents that may spread throughout the education processes of students. Through the encounters with design students in design projects or different courses, design teachers can get to know their personalities, experiences, values, and beliefs. Moreover, they become familiar with design students' working efforts in a design project, passion to research and design, attitudes for idea generation, difficulties they faced during design practice, innovative and creative touch they bring to their design works, etc. in design studio courses. These can help to understand students' designer characteristics and create a profile in the eyes of teachers. Via undergoing interactions and acquisitions, design teachers can embrace and recall the students' approaches related to design practice and process. This repertoire facilitates them to identify themselves with the students and enables them to take the student perspective easily.

However, the identification of design teachers with their students can occur at different levels depending on the destructive or supportive nature of previous experiences or the student's transference (see Ochsner, 2000), therefore have distinctive responses in and impacts on their interactions with the students. In a negative sense, tough studentship experiences of design teachers can cause them to believe in the necessity of a destructive teaching attitude in design education. In a positive sense, encountering a particular situation where students are experiencing some difficulties in the design process similar to those once experienced in the studio leads design teachers to identify themselves strongly with the students and may try to facilitate the challenges for them unconsciously (Ochsner, 2000), like the above-mentioned studies highlights (see Chapter 4 and 5). At this point, it can be said that decisive experiences of design teachers in their own approaches are conveyed positively or negatively through design conversations.

It is believed that design teachers' perspective-taking practices help them to overcome their own biases. Herein, design teachers can revisit their own student experiences and acquisitions, however may obviate the negative and traumatic countertransference in design conversations. Enabling design teachers a genuine interest to understand the students' experiences, motivations, challenges etc., perspective-taking towards design students can allow design teachers to attain what kind of support the students need and how they solve the problems themselves. Aiming to enhance the students' learning processes and experiences, design teachers can be prone to deal with the anxiety and frustration of the students by tackling uncertainty and confusion and also help them to cope with those difficult emotions and failure so that design students can be motivated to continue to explore.

6.1.1.2 Empathic perspective-taking as a performance offering a common language and criteria

"The user," as a fundamental part of design reasoning, is not a fixed and single but a creation of designers in the design process, like the construction of meaning (see Krippendorff, 2006; Oygür, 2018). Throughout the design process, a variety of user modelling activities in practice help them to make presumptions about the potential users and their expectations (Hasdoğan, 1996). As one of the experimental user models, self-modelling activity "in which the designer considers himself as the user

and acts out the usage process” (p. 28) is a commonly employed method by designers. Otherwise, the design process centres upon a scenario building activity dependent on the designer's imagination. Therefore, designers can facilitate the scenario-based models, which are “based on formal or informal story lines relating to users, usage, the usage environment and the usage circumstances” of the design (p. 22). This activity is usually employed as a “thought-based procedure” in which designers are putting themselves in somebody else's situation and creating a story about how the designed artefact would be used (p. 29). Scenarios can be built on the user's level of experience, people with special needs, secondary usage, third parties as users, worst cases, misuse and abuse, etc. in order to foresee the usability of the designed artefact (see Hasdoğan, 1996). It can be said that design teachers' perspective-taking towards users considerably includes the synthesis of these two modelling performances to genuinely explore the designed artefact bodily and intuitively as an user encounter.

A “performance” is considered as an activity of a person including speech, gestures, facial impressions and attitude to influence others (Goffman, 1959). In-studio environment, these can be framed as the daily behaviours and interactions of both design teachers and students (see Karabulut and Merzali Çelikoğlu, 2019). From the dramaturgical approach to understanding the interaction between people, design studio is a setting that enables the “designated performance starts with entering to the corresponding setting and ends with leaving it” by a performer, relying on a dramatic realisation of playing a role (Karabulut and Merzali Çelikoğlu, 2019, p. 3). Within this context, it can be said that design teachers can play a user role via perspective-taking, which is one of the prominent performances. In different roles and stories, there appear “a wealth of associations about objects, places, events, and activities, each of which can serve as productive search links” (Chou and Tversky, 2020, p. 3). Thus, perspective-taking of design teachers towards different users has the potential to create a wide range of associations that serve for the generation of novel uses, so can cultivate design ideas (Chou and Tversky, 2020).

User perspective-taking performances of design teachers take shape according to the content of the design projects and the user groups it addresses. These depend on the user profiles in their minds and the reinterpretation of them via students' user representations brought in design studio courses (see Chapter 4 and 5). Through imaginative identification and simulations, these are the roles that the design teacher

enters into, plays and leaves at the end of the performances, which can be shaped instantly or be undertaken during a design conversation. Alongside the user roles they are familiar with, design teachers can also identify themselves with extreme users, such as children, elderly individuals, disabled individuals, etc., based upon their own knowledge and assumptions. Specifically, they try to create extraordinary usage scenarios regarding the potential users, such as unintentional uses, misuses, accidental cases, etc. These performances help to demonstrate the potentials of the designed work of the student and to challenge the student's proposal by identifying the constraints (see Chapter 4).

This type of design conversation and critique can also provide unfiltered feedback for students through the end users' possible responses and practical reactions. Thus, the perspective-taking activity can help students to take some distance from their creation, observe the speculated user experience and perceive a user viewpoint that may allow them to create better work. This kind of approach can be associated with the operative impacts of empathy enhancing the process and the outcomes of design activity (see Chapter 3).

Design teachers' perspective-taking towards users relying on modelling activities, performances, imagination, and scenario building, etc. is intrinsic in the design itself. Moreover, perspective-taking of users, which depends on what the project is and the potential users within the project, occurs project-based. As understood from the studies (Chapter 4 and 5), design teachers also offer user perspective-taking to their students as a self-learning and evaluation tool in their design practices in order to help students to be reflective on their design process as well as to create a mutual language in design conversations. While demonstrating how students can critically examine their designs by putting themselves in the user's shoes, design teachers also prompt students to imagine different scenarios related to their users in order to inspire. In this way, both parties in the design conversation can meet with a common design language through user experience that cultivates in-studio contexts positively (see Chapter 2) by improving learner-teacher relationships, understanding, and discourse (see Chapter 3).

6.1.1.3 Empathic perspective-taking as an agentification of unspoken

Material artefacts including “sketches, manipulatives, 3D models, toys and games, or the scrap materials found in makerspaces” are the integral parts in many learning

environments (Sawyer, 2022), like in arts, crafts and design education. In various stages of design practice, designers turn their interpretations and ideas into visual representations in the form of drawings, mock-ups and prototypes (Hasdoğan, 1996). Design studio education relies on the engagements of design students in hands-on project works in response to open-ended assignments (Sawyer, 2022) including experimentations on materials, making drawings of their ideas, building mock-ups and models to represent, developing prototypes to test etc. that weave learning with action (see Mäkelä and Löytönen, 2015). During design conversations, design teachers make interpretations and ask questions about these representations of students to explore the intention of students and also to present particular opportunities or special features of the design with the purpose of helping them to see and understand their own work (Ochsner, 2000).

Although the material artefacts that play an essential role in the pedagogical encounters do not speak or move on their own, they can be considered having autonomous agency and engaging in interactions with humans on an equal basis (Sawyer, 2022). Latour (1996) also underlines the same importance and influence of the non-human entities in the social networks with the other actors. They “appear associable with one another and with social ties only momentarily,” (Latour, 1995, p. 78) so can be taken into account “as long as they are rendered commensurable with social ties” (p. 80). However, their visibility can be enhanced while creative processes continue such as in “the artisan’s workshop, the engineer’s design department” (p. 80). Relying on the simultaneous development of non-human entities with its connected network of actors (Miettinen, 1999) in situated social practices, the design studio settings are the hubs of creativity and innovation for the still-emerging artefacts (Sawyer, 2022). Within this context, Sawyer (2022) theories this situated social practice as “animating artefact agency” by “a close interaction analysis of both talk and nonverbal actions” between teachers and students (p. 461). Pedagogically, the artefact’s agency can allow students to improve the creative process (Sawyer, 2022). Thus, in those social practices, design teachers revive the works of students as having autonomous agency, give them voices, as well as speak of “the artefact’s actions, needs, and internal dynamics” (p. 461). Those provide students opportunities “to learn how to participate in the dialogue of creativity—an iterative process in which the creator interacts with the work as a jointly participating creative agent” (p. 461). Herein, perspective-taking of design teachers

towards materials that include projection, enactment, simulation, etc. can also be associated with the animating of artefact agency.

Identified by psychoanalysis, according to Ochsner (2000), projection co-mingling of internal and external reality is based on experiencing the physical entity of an artefact by perceiving it simultaneously. In this manner, an artefact seems to be alive and speaking in a creative play between teachers and students based on acting, reflecting and acting again. However, this is possible when they open to discover and embrace the “absurdity of experiencing the object” as more than known without imposing (Ochsner, 2000, p. 196). The dual conversation between an architect and an inanimate human-made object from Louis Kahn’s story is exemplified by Ochsner (2000) includes questioning the wants of the brick and receiving a reply that meets the inner reality of imagination and the physical reality. As a powerful tone in education, the embodiment is “the enactment of knowledge and concepts through the activity of our bodies” (Lindgren and Johnson-Glenberg, 2013, p. 445) in “any meaning-laden space of learning” (Witteman, 2020, p. 74). One’s own knowing body and sensorial sensations help one to get phenomenological insights shaped by the constant interaction with the environment and rediscovery of the material (Skrzypczak, 2021). Bodily inquiries of materials in design practice help practitioners to “learn how to attain new, nonhabitual possibilities of interaction” (Skrzypczak, 2021, p. 55), that can be addressed as an empathic experience (means) in a spatial context (see Chapter 2) within the scope of this thesis.

As understood in the precedential studies (Chapter 4 and 5), design teachers can imaginatively project onto and materialise themselves with educational and scrap materials as well as design works of students, especially three-dimensional representations, such as mock-ups, models, and prototypes. Within this context, these materials and artefacts in the creative process are recognized to have a capacity for agency in constituting empathy, “which is the act of finding the other in the self and the self in the other” (Sinuefield-Kangas et al., 2022, p. 40). The adoption of the ongoing discursiveness of material representations (Sinuefield-Kangas et al., 2022) is associated with the perspective-taking of design teachers during design conversations in this study. In the design studio setting, design teachers verbalise and embody the voices of materials and artefacts within the context of their behavioural

potentials in design conversations via both performative and discursive deliveries through the perspective-taking of students' works.

Taking the perspectives of materials in design studio courses are project-based practices, which vary depending on the brief of the project, which materials it contains, at what stage of the project, and what quality of artefacts and representations are produced. Like people, design artefacts and objects have *sui generis* bodies. To materialise themselves, design teachers associate their own human bodies with the physical entities of materials to imitate them regarding their types, properties, or behaviours. From the perspectives of materials based on their physical properties and potentials, design teachers describe the material behaviours with their own bodies via *bodystorming* including movements, gestures, and facial expressions with the support of verbal deliveries in design conversations. Design teachers encounter these artefacts and objects tactually as well as show the strong and weak points, physical pressure and resistance of the models or materials bodily. By interacting and playing with the materials, they improvise and demonstrate their possible actions, such as bending, rolling, folding, pulling, pushing, stretching, etc. and examine the form of the artefacts regarding distinctive behaviours of the actual material. Moreover, they enact the physical similarities with the artefacts while talking with them and listening to their responses. These performances demonstrate design students the possible material interactions and can help them to observe how to talk with the materials in a designerly way to develop novel ideas and interactions with them. It can be related to perceptive impacts of empathy aiming to lead design students to adopt a new design approach and formative impacts developing their designer and researcher identities (see Chapter 3).

6.1.1.4 Empathic perspective-taking as a balance of power towards an authentic conversation

The master-apprentice hierarchy puts students in a passive position in learning. This teaching model encounters and promotes the domination of teachers and also causes an asymmetry in power relations in design courses (Oh et al., 2013). The maldistribution of power relations and hierarchical roles in the design studio can create dialogical inequalities and legitimise the authority of design teachers (see Webster, 2007) as well as challenges the interactions and conversations between design teachers

and students (see Dutton, 1991; Webster, 2007), as highlighted at the beginning of Chapter 2.

Rather than persuasion and domination in design conversations, design teachers can balance the power relations and ensure a reciprocal dialogue with students in the studio (Freire, 1970). Within this context, the embodiment of empathy in design studio and perspective-taking in design conversation can be addressed to break the vertical patterns of authoritarianism, fight against the undergoing hierarchical teaching models and pedagogical roles, so can democratise the studio. Towards an empathic design education, design conversations in the studio can be revisited through these concepts having a potential to positively transform the teacher-student interaction.

Design teachers are able to take different perspectives of distinctive animate and in-animate agents in design conversations in order to establish cognitive and emotional congruence with design students that lead to the development of direct or indirect understanding in an empathic way. Thus, within the context of design education, empathy is associated with perspective-taking of design teachers during design conversations to make connections both cognitively and emotionally with design students by engaging in allocentric views steering away from egoism and authority (see Chapter 4 and 5).

However, the teacher-centred approach, where teachers are the only source of authority and knowledge, “marginalises the student's voice, ends up with shallow learning, and drives students' tendency to mimic the teacher, thus breaking the reflective learning process” (Abdelaziz, 2021, p. 94). In this approach, students' learning activities only depend on their teachers (Dutton, 1987), who can impose their views on the students and be result-oriented (Abdelaziz, 2021). Herein, design students try to meet the teacher's expectations (Dutton, 1987). Shifting from the linear and reductionist approaches (Soylu et al., 2017) towards the user-centred teaching models, different ways and means of communication are required to be developed for knowledge creation that motivate students and facilitate their learning processes (Abdelaziz, 2021). At this point, empathy can promote design teachers to be like a sharing person instead of an authoritative figure, who moderate hierarchy in the studio, engage students to learning and create safe space for everyone and voice. Herein, the importance of the connective impacts of empathy, which provides the learners'

involvement in learning activities by increasing their care, can be mentioned (see Chapter 3).

In addition to this, perspective-taking can be addressed as an empathic action going beyond the teacher-centred approach and egocentrism. Especially, design teachers can identify themselves with different users and stakeholders of the project as well as materials, take on these roles and speak from their perspectives, rather than evaluate the design works of students via their personal opinions and tastes. This approach can ensure that teacher-student interaction occurs on a shared ground that can be cultivated by both parties' knowledge and critical inquiries. Thus, perspective-taking enables design teachers to step outside the restraints of their own biases and allows them to engage in allocentric views by eliminating only egocentric ones (see Ryokai et al., 2022). Moreover, these conversations are able to allow design students to see their design works from different perspectives compared to critiques based on the teacher-centred views only.

6.1.2 Framing the traps of empathic perspective-taking in design

Through empathic perspective-taking in design conversations, design teachers and students get engaged mentally, emotionally, and bodily via discourses, performances, facial expressions, gestures, etc., so understand each other genuinely. Even though advancing understanding of other agents in many ways, Mattelmäki et al. (2014) underline the “empathy trap” that designers can run into. As understood here, according to the level of the internalisation of designers with the other agents, they may lose their ways and “the attempt to be empathic might articulate popular reflections instead of innovating more radical futures” (p. 73). Designers' meticulousness and ability to include not only their empathic relations established but also their own knowledge and intuition in the design process can enable more creative and innovative ideas to emerge and present them to fall into this trap.

Similar traps can also be mentioned that design teachers may fall into in design conversations. Regarding the empathic perspective-taking of design teachers, failure to adopt allocentric views, over-internalization of agents, or uncontrolled projection of themselves may cause particular obstacles and disruptions in the learning processes. In this section, these will be discussed below along with their relationships with the findings of the studies.

It has been mentioned (see Section 6.1.1.1) that design teachers aim to catalyse the problems and challenges for students in learning processes by recalling their own traumatic experiences. However, sometimes their personal defences against uncertainty can dominantly come into play in design conversation to assure the success of students (Ochsner, 2000). Thus, they may over-internalize students' emotional and mental states regarding their design process and also may see and embrace student's design works as their own teaching achievements in a way (see Ochsner, 2000), so this situation can drag them to a kind of *over-sympathy* trap. This refers to pity and a protective instinct rather than the concern for creating an empathic and mutual understanding with the student regarding design practice. This pedagogical approach of design teachers can be associated with being a parental figure that only serves for affective learning processes (see Efilti and Gelmez, 2021) or having particular psychologist attitudes aiming to repair the negative feelings (see Efilti and Gelmez, 2023a). Herein, design teachers may over-personalize the relationship with the student, so this situation can hinder them from taking the perspectives of students and limit the student's self-learning processes with over-abundant guidance. By this way, it can be said that empathic teaching strategies and pedagogy have been disrupted, so the competences and identity formation of the design students can be affected in a negative sense (see Chapter 2). To tackle this trap, design teachers can develop and implement empathic teaching strategies (see Chapter 2) and learning components (see Chapter 3) that help them to define their own pedagogical roles and approaches in design studio conversations. By this way, they may prevent them from the uncontrollable attachment and the internalisation with the students' emotional state regarding design practice.

In addition to these, it has been addressed (see Section 6.1.1.2) that user perspective-taking of design teachers can provide a common design language and criteria in design conversations. As understood from previous studies (see Chapter 4 and Chapter 5), this perspective-taking practice is cultivated from their previous interactions, studentship, professional and daily experiences regarding these users, as well as their "familiarity" and "relatedness" because deep understanding is more than just knowing about the other, but "includes relating to" (Kouprie and Visser, 2009). The more consciousness and knowledge a person have of surroundings interacting with and the individuals the person relates with (López-León and Gómez-Valdez, 2018), the simpler it is for the person to "slip into empathic mode" (Wiseman, 2007, p. 64) and

easier to take that perspective. However, if design teachers see themselves as one of the users addressed in the design project and over-relate themselves with the user personally, they may accept and apply their own wishes and preferences as design criteria rather than the obtained user data. This can be called an *over-relation* trap and this attitude can challenge in-studio interactions (see Chapter 2), the approaches and performances of students that affect their design processes and outcomes drastically (see Chapter 3). To tackle this, it may be important for design teachers to be aware of their own biases and to discern how these countertransferences echoing on the students' design projects. Rather than a persuasion of personal user criteria, it may be more appropriate to adopt an attitude that supports the self-learning of students and encourages them to pursue their user findings to innovative levels via anti-bias pedagogical interventions (see Chapter 3).

Moreover, it has been scrutinised (see Section 6.1.1.3) that perspective-taking of design teachers towards materials in design conversations support the capability of artefact agency and also give voice and appearance of their potentials. Even though perspective-taking performances of design teachers can guide design students to inspire and expand their thinking horizon sufficiently, they may identify themselves with the agency of the material and artefacts excessively so may not be able to go beyond the possibilities provided. During design conversations, they may take an attitude imposing “the wants” of materials and artefacts onto student's works by only focusing on manufacturability and feasibility of the design instead of creativity and innovation, which can be called an *over-materialization* trap. This approach may negatively affect students' design practices and processes, causing them to be unable to produce new ideas and to limit their creativity within these potentials. To protect themselves from these, design teachers can develop innovative teaching approaches that balance the integration of their perspective-taking approaches in pedagogical interventions regarding design education (see Chapter 3).

On the other side of the coin, it has been highlighted (see Section 6.1.1.4) that design teachers may not be able to extend their own knowledge of the field without empathic perspective-taking so stay within the frame of self-centeredness. Design teachers may not have had design studio experiences and education, or they may have particular difficulties to associate themselves with the current design studio experiences of students due to generational, ecologic, institutional differences, etc., so they may not be

prone to take the perspective of students in design conversations. If design teachers have no knowledge about a particular user group addressed in the design project or had an inability to relate themselves sufficiently via students' representations, this may hinder them from taking the perspective of users in design conversations. Moreover, if the design teachers have no experience with the relevant materials or artefacts before and cannot predict their behaviours, this perspective-taking experience may be disrupted. Due to these obstacles, their design conversations and critiques may be limited to their own thoughts and wishes as an authoritative figure. At this juncture, the interactions and understanding between design teachers and students can evolve into a *self-centred* trap where design teachers just impose themselves and their thoughts on the students and their design works. This approach may have a negative impact on teaching and learning experiences (see Chapter 3), especially students' cognitive developments (see Efilti and Gelmez, 2021; Chapter 3). Within these contexts, self-reflection of design teachers can help them to evaluate their own behaviour toward students and influences on their learning processes via empathic perspective-taking practices that shape their teacher profiles (see Chapter 3). Herein, self analysis of design teachers requires to focus on whether their interactions and conversations with design students "is a growth-promoting symbiosis that is helping the student move to a position of being independently able to engage in the creative play of design" (Ochsner, 2000, p. 202). Design teachers can be open to interpreting and learning from the experiences and representations of students, which lead to the constant reconstruction of their knowledge towards students, users and materials. These can shape their teacher profiles and pedagogical approaches (see Chapter 3).

As a conclusion, even though the above-mentioned learning disruptions are not exactly opposite each other, design teachers should try to stay in the empathic zone in a swing between these traps, which have blurred boundaries (see Figure 6.1). Staying this zone in design conversations can provide an empathic equilibrium in design studio education.

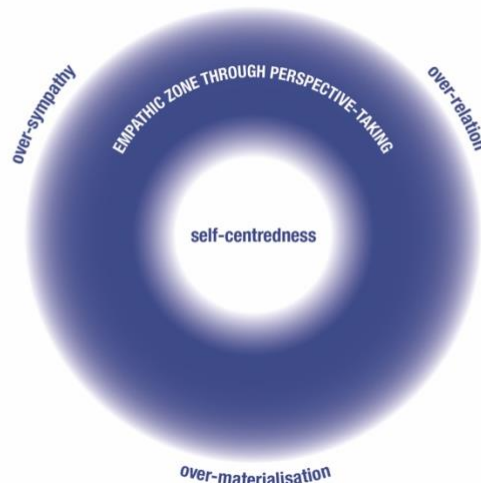


Figure 6.1 : Empathic zone through perspective-taking.

6.1.3 Practical implication: Pedagogical exercises for design teachers towards an empathic design education

To be developed and used in future studies, another implication of this thesis can be the proposals of the practical tools based on empathy and perspective-taking. Considering the findings of the previous studies, the development of pedagogical exercises for design teachers, who are both experienced and in early-stages, can be shaped in order to raise their own awareness, ensure their well-being, reflect each other and become empowered. Within this context, pedagogical exercises that can be developed and carried out at personal, collective and institutional levels are addressed.

6.1.3.1 Personal level exercises to improve pedagogical awareness

Becoming a teacher in higher education is a journey of personal development and transformation (Žydzīūnaitė and Daugėla, 2020). Because teachers can only facilitate the personal education of others if they become students of their own personal education (Underhill, 1992). The personal and professional growth of teachers depends on their own willingness to evaluate their own behaviours that helps them to become self-aware regarding their interactions with learners and their effects on learning processes (see Richardson and Shupe, 2003; Underhill, 1992).

More than an awareness of the external contexts to teach, the professional self-awareness of design teachers is also a key component for identity development that relies on active thinking, self-understanding and self-reflecting (see Žydzīūnaitė and Daugėla, 2020). Within the context of this study, the self-awareness of design teachers

regarding their perspective-taking approaches in design conversations and their particular effects on the learning processes of design students can be supported with the development of self-reflecting tools.

The findings of pedagogical probe study (see Chapter 5) show that this kind of self-reflection exercise provokes participants to think on their studio teaching practices in a critical way and raise their awareness about their empathic approaches regarding perspective-taking. To provide contextual reflection on their own experiences, the pedagogical probe study can be reconsidered as a personal empathy diary for design studio teachers in the following studies with the integration of constructive tasks. Such a tool can help design teachers to understand and improve their own empathic teaching approaches.

Based on their ongoing design studio courses, they can recall, exercise, document, and reflect on their own design conversations via this personal diary. They can be able to define how they conceptualise empathy phenomenon, empathy in the studio, empathic design conversation. Then, they can exercise to take the perspectives of student, user, and material positions in design conversations from day to day. Design teachers can also record and document their design conversations written, auditory, or visually between their students and capture the empathic indicators of how they take an agents' perspective, what deliveries they utilised, how design students respond, what the impact of this on designed artefact or learning attitude of student in a short- or long-term process, etc. By this way, they can reflect on their own performances and also manage them differently according to student grade, content of the project, etc. By this way, their own empathy development is supported. They can also develop their own approaches to give a most beneficial impact on the learning processes and identity formation of the students.

Learning processes and teaching activities take shape by the virtue of the empathic understanding between design students and teachers. Thus, this documentation tool can be evaluated for the reflection of design students regarding empathic understanding and perspective-taking practices of their teachers and how these impact on their own learning activities and design practice. Therefore, design teachers can get feedback about their teaching approaches in design studio courses.

6.1.3.2 Collective level exercises to provide pedagogical wellbeing

Beyond self-reflection and awareness, the pedagogical probe study (see Chapter 5) addresses the research gap on the collective dimension of empathic teaching development of design teachers, based on peer-reflection. Predicated upon the reflective practice theory (see Schön, 1987), collective reflection of teachers “become a *de rigueur* activity in teacher professional development” (Segal, 2024). Guiding emotions, motivations, attitudes, and behaviours, collective efficacy (Ünver, 2021) can improve teaching approaches and pedagogical thinking (Hauge, 2019). In the professional learning communities, teachers benefit from each other's personal practices and experiences via sharing and supporting values and vision that lead to collective learning and development (Ünver, 2021).

Within the context of this study, the findings of the participant observation and pedagogical probe study can be readdressed for the development of the collective tools and exercises for the use of design teachers and supporting teaching staff. Regarding the discussion of empathic teaching approaches and perspective-taking practices in design conversations, the design of workshops, pedagogical toolkits, games, participatory simulations, role-playing or storytelling activities, etc. can be considered in the further studies.

In collaborative workshop sessions, design teachers and supporting staff can take the perspectives of design students, users, and materials, even different agencies in design conversations respectively. They can share their previous and ongoing experiences in the perspectives of these agencies, as well as reflect their motives and drivers during these practices, so they can learn from each other. In imaginative design interactions and conversations like used in the pedagogical probe study (see Chapter 5), they may simulate these agencies and their awareness is raised collectively.

These perspectives can also be evaluated as characters in the pedagogical toolkits and games (see Vaajakallio, 2012) “that playing a role allows participants to step out of their ordinary cognition” (Mattelmäki et al., 1993, p. 73). These toolkits and games can be conducted with graduate students in the courses at PhD level to improve a collective awareness regarding empathic design teaching approaches. In particular enactment sessions, they may also perform particular scenarios in the perspectives of the agents to understand the complexity of the design studio interactions. Especially,

early-stage design teachers can benefit more from this. In the future, these practical tools can provide pedagogical wellbeing towards empathic perspective-taking through peer-reflection and lead to collective discussion and knowledge creation of design teachers and researchers.

6.1.3.3 Institutional level exercises to ensure pedagogical empowerment

Despite the crucial pedagogical responsibility of design teachers and supporting staff in design studio education (see Efilti and Gelmez, 2021, 2023a), they do not have pedagogical training before they become teachers (see Efilti and Gelmez, 2021, 2023a; Genç, 2023). While some undergo pedagogical training that is generalised and covers all academic branches, there is no specific way for design education or design studio interactions. However, the professional development training of teachers shape their behaviour in teaching approaches (see Kyriakides et al., 2009) and have significant positive impacts on student achievement (see Harris and Sass, 2011). Moreover, design education faces the new demands of the 21st century (Meyer and Norman, 2020) and to cope effectively with educational changes (Guasch et al., 2010) the professional development training for design teachers can be shaped via training programmes, thematic seminars, particular courses, etc. In the quest of empathic design education, the findings of this study can also serve for the development of training about design pedagogy.

In light of the studies' findings (see Chapter 2-5), decision-makers can take significant steps to integrate empathy in design education and distinguish its impact on learning and teaching activities. Herein, they consider guiding tools and evaluation instruments for the design teachers while developing design curriculum, design projects, and design conversations in an empathic way. Institutions can ensure particular platforms for design teachers and supporting teaching staff to share and discuss their teaching practices and help them to develop novel approaches.

Higher educational institutions may also be able to train design teachers and develop teaching approaches regarding empathy and perspective-taking. Herein, collective exercises above-mentioned can also be addressed as the initial models of pedagogical training for design teachers. Pedagogical empowerment of the teacher community towards an empathic design education can be ensured by this way. Especially, the early-stage design teachers and supporting teaching staff may need guidance in

understanding and developing their teacher roles and impacts in design studio education. In this context, PhD level courses can also be designed to carry out pedagogical exercises regarding empathic interactions and perspective-taking practices. These exercises can empower them in different aspects with respect to their pedagogical experiences and improve communal well-being (see Genç, 2023).

6.2 Revisiting Research Objectives and the Synthesis of Research Findings

This thesis mainly aims to understand how empathy is embodied in design education. To explore this research inquiry holistically, this thesis is based on three phases, such as “scanning the horizon,” “deep diving,” and “mining together,” which represents different publications including distinctive objectives (see Figure 6.2). Herein, how each publication is related to each other is also discussed regarding research findings.

The first phase of the thesis (scanning the horizon) covers a systematic identification of the relevant literature. In the first study of this phase (see Chapter 2. Mapping the dimensions of empathy in design education), the relevant literature intersecting design education and the concept of empathy is identified via a systematic scoping review study in order to discover and map the dimensions of empathy. The dataset is analysed via qualitative content analysis method. The deep and iterative review process shows the three dimensions of empathy in design education. One of them is defined as *educational interventions*, which are the educational activities being applied or mentioned at micro, meso and macro levels. When looking at the interventions, they are mostly carried out as design project development and integrations in the studio/course that will enable learners to provide empathic understanding or development at micro and meso levels. Herein, the development of studio-based learning strategies at meso level is seen as an area that is barely mentioned in the relevant literature. The second dimension is defined as the *aspects of empathy*, which represents how this concept is materialised with specific educational purposes in design education plying between the explicit to implicit levels. The instrumentalization of empathy is mostly embraced as a competence referring to a design skill at a more explicit level. The aspects of empathy adopted as a teaching strategy that integrates the means in the studio/course, develops the competences and affects the identities of both teachers and learners has been discussed less in the literature. The last dimension is the *contexts of empathy*, which represents the distinctive contexts from individual and

social levels in which empathy serves the learning processes of design. The relevance of empathy to design education appears to be prominent in the out-of-studio context, which focuses on the improvement of interpersonal interaction and the understanding of stakeholders at the social level. Compared to out-of-studio context, in-studio context is also seen as an inconsiderable topic in the literature.

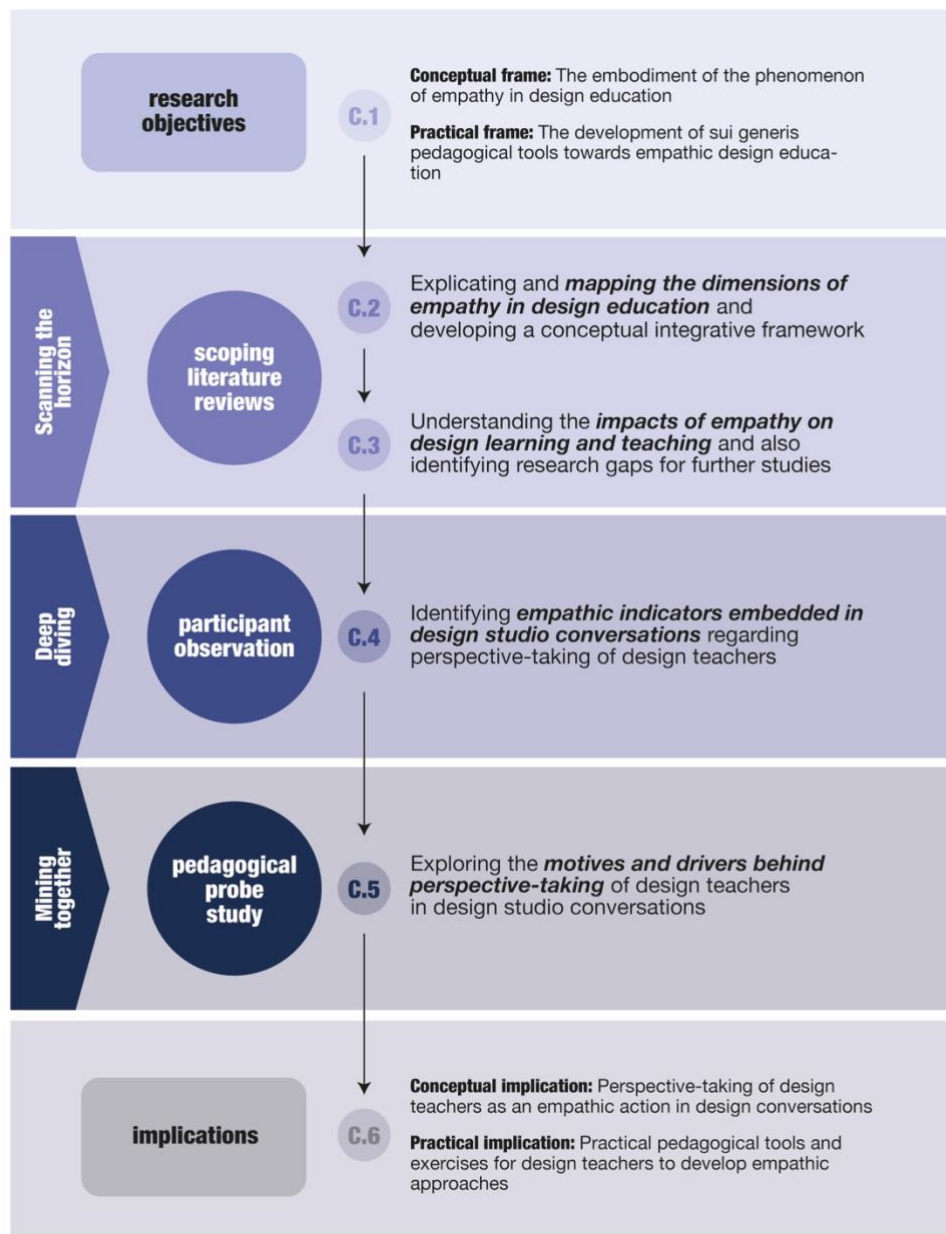


Figure 6.2 : Overview of the thesis.

Uncovering the hidden dimensions of empathy in design education helps to generate a conceptual model through these dimensions and to create an integrative framework of the relevant literature. This framework proposes a clarification for the ambiguous

nature of empathy in design education and leads to the identification of less-concentrated areas in the literature. Examining the relationship among dimensions of empathy in design education shows that the distribution of relevant literature mostly focuses on the intersection of micro/meso, explicit and social levels. However, this study also shows the less-concentrated alignment in the design studio that addresses empathic interactions between design teachers and learners. Thus, the improvement of the empathic teaching strategies and pedagogical interventions of design teachers that shape personal empathic awareness and in-studio interactions have a significant potential to focus on in the following studies (see Figure 6.3).

Empathy penetrating the design context both transforms the learning processes of learners and the teaching approaches of design teachers. Thus, in the second study of the first phase (see Chapter 3. Diving into the impacts of empathy on design learning and teaching), the dataset via the systematic scoping review study is analysed thematically to discover the impacts of design learning and teaching activities correspondingly, and to posit the research gaps for further studies. The eight themes appear, such as cognitive, affective, interactive, collaborative, operative, perceptive, formative and connective. The *cognitive impacts* including the sub-themes of cognitive and meta-cognitive development; the *affective impacts* covering the sub-themes of development of emotional awareness and emotional skill development; and the *collaborative impacts* are associated with learning processes only. The *interactive impacts* consisted of the sub-themes of the improvement of the learners' interactions with the user/stakeholder, with the peers and/or within the groups/teams as well as with the teachers; the *operative impacts* related to the sub-themes of the development of design practice, design outcome, and learning components; the *perceptive impacts* including the sub-themes of the development of understanding about social issues, the adoption of new design approaches, and the development of teaching approaches; the *formative impacts* containing the development of personal traits, designer, researcher and citizen identity as well as teacher profile; the *connective impacts* covering the sub-themes of the improvement of learners' engagement and the development of pedagogical interventions are associated with both learning processes and teaching activities.

When we look at the distribution of themes regarding design learning and teaching, it seems that cognitive, affective, interactive, collaborative, and operative impacts of

empathy on design learning are more visible in the literature; however, there is a significant research gap related to the impacts of empathy on design teaching. Especially, the connective impacts that are particularly related to the development of empathic ways of teaching, are relatively less addressed in the relevant literature, so are open to investigation. The distribution of themes regarding design learning and teaching can also be utilised methodologically, which leads researchers to develop methods to make empathy explicit in design education and to provide a repertoire for design teachers to create more positive studio dialogues and interactions (see Figure 6.3).

The first phase highlights that the relevant literature less-concentrates on in-studio interactions between design teachers and students regarding empathy. This area is aimed to be addressed in the following study. In design studio courses, design conversations including design critiques and juries are primary interactions between design teacher and students. Thus, the second phase (deep diving) covers an interrogation to uncover the empathic indicators embedded in design conversations.

In the study of the second phase (Chapter 4. Eliciting empathy embedded in design conversations), empathy is addressed within the design studio conversations between design teachers and students as an embodied happening. The indicators regarding empathy embedded in design conversations are observed and analysed to explore how design teachers take the perspectives of different agencies during design conversations as well as what delivery styles are utilised for the empathic perspective-taking. The data obtained by participants observation studies at two different universities is analysed via an ethnographic content analysis regarding research objectives. The findings show that design teachers take the perspective of both human and non-human agents during design studio conversations as design students, users and materials. Taking the perspective of these agencies are the strategies embedded in design conversations to ensure empathic understanding with their students regarding design practice on different communication levels having distinctive roles in learning processes. Moreover, it is understood that design teachers utilise discursive and performative deliveries to invoke perspective-taking.

On an intersubjective level, design teachers can *take the perspectives of design students* mostly intertwined with empathic listening and compassion to ensure emotional congruence, which refers to direct empathy. This type of interaction also

aims to enhance the learning experiences of design students. Moreover, on a representative level, design teachers can *take the perspectives of users and materials* via imaginative projection and simulation to provide cognitive congruence which refers to mediated empathy. Taking the perspective of users and materials help the students to observe and understand the implications of design. As understood, design teachers not only take the perspective of distinctive agencies during design conversations but also offer students to support their designerly way of thinking. Furthermore, during design conversations, design teachers use both *discursive deliveries*, which are based on verbal, perceptual and emotional indicators, and *performative deliveries*, which are based on physical, visual and bodily indicators that serve for the imaginative projection of design teachers towards human and non-human agencies.

This study enables us to picturize how empathy is embodied in design studio conversations, which is an initial step to frame the empathic approaches of design teachers. In future studies, perspective-taking of design teachers in design conversations as an empathic action, which enables adopting allocentric perspectives of the significant agents of design education as well as establishing empathic understanding with design students through these perspectives can be discussed within a conceptual framework. As a *sui generis* teaching activity intrinsic to design, increasing the awareness of design teachers about their own perspective-taking practices and approaches and their distinctive effects on learning processes have a potential to improve their communication and interaction with the students. Herein, the findings of this study which just rely on the researcher's observations require to be examined and expanded with the participation of design teachers (see Figure 6.3).

The second phase frames the embodiment of empathy in design education which is embedded in design studio conversations via perspective-taking. To anatomize this phenomenon comprehensively, the last third phase (mining together) digs into the empathic perspective-taking phenomenon to develop in-depth understanding specific to design teachers and teaching activities.

In the last study covered by the third phase (Chapter 5. Digging into the empathic perspective-taking of design teachers) the empathic perspective-taking during design conversations is treated as a more holistic empathic approach of design teachers by engaging in allocentric views. To explore the motives behind this phenomenon, a

pedagogical probe study, which is based on the active participation and self-documentation of design teachers and supporting teaching staff, is conducted a designerly approach to research. Relying on the pedagogical inquiries and exercises hinged upon both an imaginative design project scenario and ongoing design studio practices, the study aims primarily to provoke the participants to recall and think about their perspective-taking towards design students, users, and materials during design conversations and reflect on their own practices in a critical way. In addition to previous studies, design teachers' *intentions* and *personal motivations* behind perspective-taking, as well as the *potential impacts on learning process* are explored in this study, the empathic perspective-taking of design teachers during design conversations are enlightened with multiple dimensions.

The main objective of design teachers' perspective-taking during design conversations is to bring an alternative viewpoint for the students and their design process. When looking at the motives behind the perspective-taking of students, it is understood that this practice includes the intentions of caring and emotional support, which is motivated by the shared experiences and challenges of design teachers with a possible impact on enhancing the learning experiences of students. Taking the perspective-taking of users relies on an intention to address the user experiences and difficulties, cultivated from the empathic and emotional relations of design teachers with that user group. Moreover, taking a material perspective aims to represent material and form affordances for students, based on the daily and professional observations and interactions with the materials. Perspective-taking of both users and materials have the effect of expanding students' thinking horizons. While taking the perspective of students cultivates their motivations, taking the perspective of users and materials provide inspiration for design practice (see Figure 6.3).

The conceptual framework can be supported through the motives behind this phenomenon obtained in this study. This study helps to comprehend the empathic perspective-taking phenomenon holistically via the pedagogical probe study that relies on the self-documentation and the reflection of design teachers. In this context, the probing approach is interpreted in a pedagogical sense that prompts participants to think about their own teaching approaches. It also highlights the need for the development of new tools in design education that leads to the improvement of a practical framework. Therefore, particular pedagogical exercises that improve the

empathic approaches of design teachers, especially for the early-stage design teachers, can be developed. Beyond self-reflection and awareness, these kinds of exercises can also be based on peer-reflection.

All in all, this thesis helps to understand how empathy can be embodied in design education. The first phase points out which area of the literature we can contribute to in this context via revealing the hidden connections of the empathy in design education. By focusing on the primary teacher-student interaction in design studio courses, which is design conversations, the second phase shows how this phenomenon is embodied in design studio settings via design conversations through taking the perspectives of both human and non-human agents with discursive and performative deliveries. Within the scope of this thesis, empathy embedded in design conversation is perspective-taking by adopting allocentric views to ensure cognitive and affective attunement regarding design practice. In addition to this, the third phase helps to expand the knowledge around the underlying motives behind empathic perspective-taking of design teachers during design conversations are explored thoroughly. The pedagogical probe study conducted in this phase constitutes a practical pedagogical tool for empathy. Via this thesis, a light is shed on the empathic approaches of design teachers in design studio courses.

Chapters	Title	Aims	Methods	Summary of Outcomes	Contributions and Defined Research Gap	Related Publication	
Scanning the horizon	CHAPTER 2	Mapping the dimensions of empathy in design education	• to identify the relevant literature intersecting design education and the concept of empathy systematically • to discover and map the dimensions of empathy in design education literature • to generate a conceptual framework through these dimensions • to discuss the potential implications for further studies	Scoping literature review and content analysis	• Three dimensions of empathy in design education as educational interventions, aspects and contexts are revealed. • The relationships among the dimensions of empathy based on the intersection of the particular axes of micro to macro, explicit to implicit, and individual to social are mapped. • Three major implications, such as research-based implications for design education researchers, pedagogical implications for design teachers and institutional implications for decision-makers, are discussed.	• The ambiguous nature of empathy in design education is clarified. • An integrative framework of empathy in design education is proposed and the areas with the most and least contributions in the relevant literature are identified. • The relevant literature is mostly concentrated at the intersection of micro/meso, explicit and social levels. • As the less-concentrated alignment, the improvement of the empathic teaching strategies and pedagogical interventions of design teachers that shape personal empathic awareness and in-studio interactions have a significant potential to focus on.	Efiliti, P. and Gelmez, K. (2023). Mapping three dimensions of empathy in design education: Educational interventions, aspects and contexts. <i>Art, Design & Communication in Higher Education</i> , 22(1), 121-148.
	CHAPTER 3	Diving into the impacts of empathy on design learning and teaching	• to explore and discuss the impacts of empathy on learning and teaching in the relevant design education literature • to address the research gaps for further studies	Scoping literature review and thematic analysis	• Empathy penetrates into the design education context, transforms the students' learning processes and steers design teaching activities. • Eight themes appear in this study as cognitive, affective, interactive, collaborative, operative, perceptive, formative and connective impacts.	• All themes have considerable effects on the learning process; however, the impacts of empathy on teaching activities are relatively limited. • Empathy has a limited relation with teaching activities that represent student-teacher interaction. • The development of empathic ways of teaching is relatively less mentioned in the relevant literature. • The development of an empathic teaching model is needed to raise the empathic designers of the future.	Efiliti, P. and Gelmez, K. (2024). A deep dive into the impacts of empathy on design learning and teaching. <i>International Journal of Technology and Design Education</i> , 34(2), 809–852.

Figure 6.3 : A summary of the thesis based on the publications.

Chapters	Title	Aims	Methods	Summary of Outcomes	Contributions and Defined Research Gap	Related Publication
Deep diving CHAPTER 4	Eliciting empathy embedded in design conversations	- to examine the embodiment of the phenomenon of empathy in design studio - to interrogate the design studio conversations between teachers and students to explore the indicators regarding empathy - to understand the perspective-taking of design teachers in design conversations - to discover delivery styles design teachers use during design conversations to invoke empathic perspective-taking	Participant observation and ethnographic content analysis	- Design conversations are prosocial behaviours and interactions in design studio courses, which include the approaches consisting of reactions and responses to foster and develop empathic understanding. - Design teachers take the perspectives of both human and non-human agencies as design students, users and materials during design conversations. - Delivery styles in design conversations leading to the identification of design teachers with these agencies include both discursive and performative means.	- How empathy can be embodied in the context of the design studio is discussed. - Design teachers can take the perspectives of design students on an intersubjective level and take the perspectives of the users and materials on a representative level to provide emotional and cognitive congruence with students. - Design teachers are not solely taking these perspectives but also offering them to students as a learning tool. - The findings of this study require to be expanded with the participation of design teachers.	Efiliti, P. and Gelmez, K. (2024). Eliciting empathy embedded in design conversations: Empathic perspective-taking of design teachers towards design students, users, and materials. <i>International Journal of Art and Design Education</i> .
Mining together CHAPTER 5	Digging into the empathic perspective-taking of design teachers	- to develop an understanding towards empathic perspective-taking phenomenon in design teaching - to obtain design teachers' motives behind perspective-taking during design conversations - to develop a pedagogical tools to explore empathic perspective-taking of design teachers through a participatory approach	Pedagogical probe and directed content analysis	- This phenomenon is treated as a communication and a teaching tool, but also a part of a more holistic empathic approach in design pedagogy. - The empathic pedagogical approaches of design teachers are addressed in a multidimensional way. - The underlying motives behind empathic perspective-taking of design teachers during design conversations are discovered, such as the intentions and motivations of this practice and its potential impacts on learning process.	- Distinctive aims and drivers embedded in perspective-taking practices that serve for the designerly way of thinking and enhancement of learning activities, the motivation and inspiration of design students particularly. - As a self-reflective tool, pedagogical probe study prompts design teachers to think about their own teaching approaches. - Beyond self-reflection and awareness, the need for a collective discussion and knowledge creation of design teachers regarding taking the perspectives of different agents is emphasized.	Efiliti, P. and Gelmez, K. (in review). Let's take a new perspective!: A pedagogical probe study for digging into the empathic perspective-taking of design teachers. <i>ANONYMOUS</i> .

Figure 6.3 (continued): A summary of the thesis based on the publications.

6.3 Limitations and Further Recommendations

In this section, limitations of the studies are delivered along with the recommendations for the use of design teachers, researchers, and institutions in the following studies.

Due to the newness of the empathy phenomenon in the fields of education, it was able to access a limited number of sources that discuss empathy within the scope of design education. Thus, the frameworks developed based on the systematic literature review studies should be reconsidered as the literature becomes saturated. Despite this, finding out how empathy is discussed in the relevant literature has been quite difficult and taken a lot of time in terms of data analysis because the sources obtained are dense and dispersed. Therefore, there may be limitations in the analysis processes based on the researcher's situatedness.

Moreover, to reach insights and nuances in the data, this thesis consists qualitative content analysis method rather than understanding quantitative and statistical analysis of the data. Thus, the frequency in data analysis does not indicate relevance by itself in this study.

The contexts of the empirical studies conducted in this thesis were based on design departments, which included industrial design and product design courses. While the research context can be addressed in specific educational settings, empathic perspective-taking can be addressed within the scope of art, craft, technology and engineering fields. Moreover, how design conversations can be shaped empathically and the perspective-taking of design teachers during design conversations can be formed in remote or blended design studio education. New non-human agents emerging within remote or blended contexts can be addressed.

This study focused on design teaching particularly. Thus, another crucial limitation of this thesis that has already been mentioned in the studies was the lack of student voices regarding empathy and perspective-taking. How students conceptualise empathic interactions with their teachers can be addressed. Moreover, how they interpret the perspective-taking practices of their design teachers during design conversations and the reflections on their design practices can be examined from the side of design students.

The core empirical study of this thesis relying on the participant observation of the researcher at two different universities was relatively limited depending on the limited context in which the data was collected. The consideration of this approach in different countries, universities and courses will possibly give more insights about the embodiment of empathy and perspective-taking.

This thesis examined the embodiment of empathy in the context of design education by focusing on design conversations. However, how empathy is embedded in the other signature pedagogies such as design studio environment, design project and brief, as well as design materials (see Shreeve, 2015) can be embraced.

Furthermore, especially in the pedagogical probe study, which is one of the empirical studies, the distribution of participants across different teaching contexts was limited. Within this context, more regional or ecole-based concentrations could be considered on a country basis.

This thesis particularly centred upon the perspective-taking of design teachers towards design students, users and materials. However, design conversations include the distinctive perspectives of agents specific to the context of the educational field (e.g. graphic design, urban planning, etc.), the type of the course (e.g. practice-based or theoretical course), the content of the design project, etc. How design teachers take the perspectives of “others” different from the above-mentioned ones such as community, institution, client, business company, etc. as well as how these perspectives contribute to the design processes and approaches of students can be addressed.

This thesis strongly associated empathy phenomenon with perspective-taking of design teachers towards the prominent perspectives of design students, users, and materials. The perspective-taking approaches of design teachers can vary depending on the content and the scope of the project, the stakeholders involved, depending on the background and pedagogical styles of teachers, the institutional ecole and various socio-cultural contexts. However, the deepness, detail, or effectiveness of these differences to the students’ learning processes has not been measured in any way. Thus, the scale of these practices can be addressed in future to serve empathy scale scanty addressed at meso-level (see Chapter 2). Moreover, the potential short- and long-term effects of design teachers’ perspective-taking practices in design

conversations can be measured in design studio conversations via the development of particular evaluation tools.

Within the context of conceptual implication of this thesis, various traps that design teachers can experience and tackle are mentioned. Knowing and sensing the boundaries of these are crucial to swinging inside an empathic zone. However, this thesis study was not expanded and the related empirical data was not collected in this context. Therefore, future studies can focus on these boundaries and bring new insights into design conversations and interactions.



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- Zingoni, M.** (2019). Beyond Aesthetics, Empathy First. *The Design Journal*, 22(3), 351-370.
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APPENDICES

APPENDIX A: 60 articles analyzed in this study

APPENDIX B: Educational interventions x Aspects of empathy

APPENDIX C: Educational interventions x Contexts of empathy

APPENDIX D: Aspects of empathy x Contexts of empathy

APPENDIX E: The preliminary analysis of the articles included in review

APPENDIX F: Three themes of design teachers' empathic perspective-taking towards design students, users and materials

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APPENDIX I: Invitation form of the pedagogical probe study

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APPENDIX N: The form of Day 4

APPENDIX O: The form of Day 5

APPENDIX P: Participant list

APPENDIX R: Coding agenda used in the data analysis



APPENDIX A : 60 articles analyzed in this study.

Table A.1 : 60 articles analyzed in this study.

Number	Articles
1	Altay, B., & Demirkan, H. (2014). Inclusive design: developing students' knowledge and attitude through empathic modelling. <i>International Journal of Inclusive Education</i> , 18(2), 196 - 217.
2	Altay, B., & Porter, N. (2021). Educating the mindful design practitioner. <i>Thinking Skills and Creativity</i> , 41, 1-19.
3	Altay, B. (2017). Developing empathy towards older adults in design. <i>Educational Gerontology</i> , 43(4), 198-208.
4	Altay, B. (2017). Multisensory Inclusive Design Education: A 3D Experience. <i>The Design Journal</i> , 20(6), 821-846.
5	Altay, B. (2014). User-centered design through learner-centered instruction. <i>Teaching in Higher Education</i> , 19(2), 138-155.
6	Altay, B., Ballice, G., Bengisu, E., Alkan-Korkmaz, S., & Paykoç, E. (2016). Embracing student experience in inclusive design education through learner-centred instruction. <i>International Journal of Inclusive Education</i> , 20(11), 1123-1141.
7	Alzayed, M. A., McComb, C., Menold, J., Huff, H., & Miller, S. R. (2021). Are You Feeling Me? An Exploration of Empathy Development in Engineering Design Education. <i>Journal of Mechanical Design</i> , 143, 112301-1-14.
8	Alzayed, M A., Miller, S. R., & McComb, C. (2021). Empathic creativity: can trait empathy predict creative concept generation and selection?. <i>Artificial Intelligence for Engineering Design, Analysis and Manufacturing</i> , 35(4), 369 - 383.
9	Alzayed, M. A., Miller, S. R., Menold, J., Huff, J., & McComb, C. (2020). Can design teams be empathically creative? a simulation-based investigation on the role of team empathy on concept generation and selection. In <i>Proceedings of the ASME 2020 International Design Engineering Technical Conferences</i> , 8, V008T08A024-1-15.
10	Annemans, M., Van der Linden, V., Karanastasi, E., & Heylighen, A. (2015). Learning to Shape Places of Care by Empathising with Patients and Caregivers. In <i>Engineering4Society</i> , Leuven, Belgium.
11	Bell-Huff, C., & Morano, H. L. (2017). Using simulation experiences, real customers, and outcome driven innovation to foster empathy and an entrepreneurial mindset in a sophomore engineering design studio. In <i>Proceedings of ASEE Annual Conference and Exposition</i> .
12	Boess, S., Saakes, D., & Hummels, C. (2007). When is role playing really experiential?: Case studies. In <i>Proceedings of the 1st International Conference on Tangible and Embedded Interaction 2007</i> , Louisiana, USA, 279-282.
13	Brueggemann, M. J., Strohmayer, A., Marshall, M., Birbeck, N., & Thomas, V. (2017). Reflexive Practices for the Future of Design Education: An Exercise in Ethno-Empathy. <i>The Design Journal</i> , 20(1), S1260-S1269.
14	Campbell, L. H., & McDonagh, D. (2009). Visual Narrative Research Methods as Performance in Industrial Design Education. <i>Qualitative Inquiry</i> , 15(3), 587-606.

Table A.1 (continued): 60 articles analyzed in this study.

Number	Articles
15	Carlson, J. D., & Dobson, T. (2020). Fostering Empathy through an Inclusive Pedagogy for Career Creatives. <i>International Journal of Art & Design Education</i> , 39(2), 430-444.
16	Chmela-Jones, K.A. (2017). Flourishing in graphic design education: incorporating Ubuntu as a curricular strategy. <i>The Design Journal</i> , 20(1), S1048-S1057.
17	Christian, C. (2019). Contemplative Practices and Mindfulness in the Interior Design Studio Classroom. <i>Journal of Interior Design</i> , 44(1), 29-43.
18	Cordan, O., Dincay, D., Yurdakul Toker, C., Oksuz, E., & Vayvay, G. (2020). Exploring Universal Design Principles within a PUDCAD Project: Local Workshops in Turkey. <i>The International Journal of Design Education</i> , 14(4), 1-18.
19	Davidová, M. (2020). Multicentred Systemic Design Pedagogy Through Real-Life Empathy Integral and Inclusive Practice-Based Education in the Research-by-Design Context. <i>FormAkademisk</i> , 13(5), 1-26.
20	de Freitas, A. P. N., & Almendra, R. A. (2021). What if...? Strategies to Teaching Communication, Empathy and Teamworking for Design Students by Design Students. In <i>AHFE 2021: Advances in Industrial Design</i> , 260, 148–156.
21	De Vere, I., & Charny, D. (2017). Social Innovation in the Curriculum: A Model for Community Engagement and Design Intervention. In <i>Proceedings of the 21st International Conference on Engineering Design (ICED 17)</i> , 9, 109-118.
22	De Vere, I., & Phillips, R. (2015). Using social engagement to inspire design learning. In <i>Proceedings of the 17th International Conference on Engineering and Product Design Education</i> , Loughborough, UK, 304-309.
23	Gamman, L., & Thorpe, A. (2018). Makeright—Bags of Connection: Teaching Design Thinking and Making in Prison to Help Build Empathic and Resilient Communities. <i>She Ji: The Journal of Design, Economics, and Innovation</i> , 4(1), 91-110.
24	Gielen, M. (2009). Essential concepts in toy design education: aimlessness, empathy and play value. <i>International Journal of Arts and Technology</i> , 3(1).
25	Haag, M., & Marsden, N. (2019). Exploring personas as a method to foster empathy in student IT design teams. <i>International Journal of Technology and Design Education</i> , 29(3), 565-582.
26	Ho, D., Ma, J., & Lee, Y. C. (2011). Empathy @ design research: a phenomenological study on young people experiencing participatory design for social inclusion. <i>CoDesign</i> , 7(2), 95-106.
27	Kakoun, N. A., Boy, F., & Xavier, P. (2021). Are Civil Engineers ‘Practicing What They Preach?’. In <i>2021 ASEE Virtual Annual Conference</i> (Online).
28	Lee, J.-J., Vaajakallio, K., & Mattelmäki, T. (2011). Tracing situated effects of innovative design methods: Inexperienced designers' practices. In <i>Proceedings of the 2nd Conference on Creativity and Innovation in Design</i> , Eindhoven, the Netherlands.
29	López-León, R., & Gómez-Valdez, G. (2018). Understanding empathy in design education. <i>International Journal of Educational Research and Innovation</i> , 10, 51-63.

Table A.1 (continued): 60 articles analyzed in this study.

Number	Articles
30	Lopez-Neri, E., Gomez-Davila, J., & Carlos-Mancilla, M. (2018). CiudadelaS IM urban modeling framework and human-centered design (HCD) learning based approaches: A pedestrian mobility case study in Monterrey, Mexico. <i>Interaction Design and Architecture(s) Journal</i> , 39, 96 - 113.
31	Lorentzen, L., & Hedvall, P.-O. (2018). Bringing Human Diversity into Design Processes Through Empathic Modelling. In G. Craddock et al. (Eds.), <i>Transforming our World Through Design, Diversity and Education</i> (pp. 128-136).
32	Malins, J., & McDonagh, D. (2008). A grand day out: Empathic approaches to design. In <i>Proceedings of the Engineering and Product Design Education Conference</i> , Barcelona, Spain.
33	McDonagh, D., & Thomas, J. (2010). Disability + Relevant Design: Empathic Design Strategies Supporting More Effective New Product Design Outcomes. <i>The Design Journal</i> , 13(2), 180–198.
34	McDonagh, D. (2015). Design students foreseeing the unforeseeable: Practice-based empathic research methods. <i>International Journal of Education through Art</i> , 11(3), 421-431.
35	McDonagh, D., Thomas, J., & Strickfaden, M., (2011). Empathic design research: Moving towards a new mode of industrial design education. <i>Design Principles and Practices</i> , 5(4).
36	Medola, F. O., Pavel, N., Baleotti, L. R., Santos, A. D. P., Ferrari, A. L. M., & Figliolia, A. C. (2021). Phenomenological Approach to Product Design Pedagogy: A Study on Students' Experiences in Interdisciplinary and Intercultural Settings. <i>Design and Technology Education: An International Journal</i> , 26(2), 86-100.
37	Medola, F., Sandnes, F. E., Ferrari, A. L. M., & Rodrigues, A. C. T. (2018). Strategies for Developing Students' Empathy and Awareness for the Needs of People with Disabilities: Contributions to Design Education. <i>Studies in Health Technology and Informatics</i> , 256, 137-147.
38	Mendoza, H. R., & Matyók, T. (2013). Designing Student Citizenship: Internationalised Education in Transformative Disciplines. <i>International Journal of Art and Design Education</i> , 32(2), 215-225.
39	Mitchell, L., & Light, L. (2018). Increasing student empathy through immersive user empathy experiences in first-year design education. In <i>Proceedings of ASEE Annual Conference and Exposition</i> .
40	Natu, A. S. (2020). Integrating behavioral research in undergraduate design studio in architecture for designing inclusive environments. <i>Journal of Accessibility and Design for All</i> , 10(2), 209-228.
41	Noel, L.-A. M. (2021). Here's What we Really Want your Class to be about! A Design Thinking Class Responds to the Pandemic. <i>Design and Technology Education: an International Journal</i> , 26(4), 50-70.
42	Peng, F., & Kueh, C. (2022). Integration of Design Thinking with Cultural Intelligence in Higher Education for a Socially Complex Environment. <i>International Journal of Art and Design Education</i> .
43	Pezeshki, C., Leachman, J., & Creston, S. C. (2015). Merging Engineering and Art What are the Real Lessons?. In <i>2015 International Conference on Interactive Collaborative Learning (ICL)</i> , Firenze, Italy.

Table A.1 (continued): 60 articles analyzed in this study.

Number	Articles
44	Prabhu, R., Alzayed, M. A., & Starkey, E. (2021). Not good enough? Exploring relationships between students' empathy, their attitudes towards sustainability, and the self-perceived sustainability of their solutions. In <i>Proceedings of the ASME 2021 International Design Engineering Technical Conferences and Computers and Information in Engineering Conference</i> (Online).
45	Prabhu, R., Starkey, E., & Alzayed, M. A. (2021). Student Reflections on Sustainability and Empathy: The Outcomes of a Sustainability Workshop in First-year Design Courses. In <i>2021 ASEE Virtual Annual Conference</i> (Online).
46	Rieger, J., & Rolfe, A. (2021). Breaking Barriers: Educating Design Students about Inclusive Design through an Authentic Learning Framework. <i>International Journal of Art and Design Education</i> , 40(2), 359-373.
47	Roja, J.-C., Muniz, G., & Higuera-Trujillo, J. L. (2020). Emotional tools design: A project to increase empathy, engagement and interest in industrial design students. In <i>ASME 2020 International Mechanical Engineering Congress and Exposition</i> (Online).
48	Santanichchia, M. (2020). Architecture Education for World Citizens. In <i>Proceedings of Schools of Thought: Rethinking Architectural Pedagogy</i> , USA.
49	Schmitt, E., Kames, E., & Morkos, B. (2016). The importance of incorporating designer empathy in senior capstone design courses. In <i>Proceedings of ASEE Annual Conference and Exposition</i> , New Orleans, LA.
50	Shin, C., & Thomas, J. (2015). Exploring the emotional experience of the user and designer, both in the design process and classroom. <i>Procedia Manufacturing</i> , 3, 2267-2274.
51	Siqueira da Silva, I. C. (2019). The Promotion of Empathy for the Experience of Users with Visual Impairment in the Game Design Education. In <i>HCII 2019: Universal Access in Human-Computer Interaction. Theory, Methods and Tools</i> , 11572, 326–341.
52	Swaranjali, P., Patel, T., & Espersen-Peters, K. (2021). Next time, with empathy: revisiting the studio pedagogy for transitional housing for refugees. <i>Archnet-IJAR</i> , 15(3), 668-682.
53	Şenyiğit, Ö., & Yılmaz, N. (2020). An Awareness Experience by Empathic Design Method in Architectural Design Education. <i>International Journal of Architecture and Planning</i> , 9(1), 242-260.
54	Thomas, J., Chen, X., Lee, I., Wang, J., Yang, Y., & Strickfaden, M. (2021). Learning Design Thinking Through a Collaborative Focus on Social Justice. In S., Cliff Sungsoo et al. (Eds.), <i>Advances in Industrial Design</i> , USA (pp. 192-200).
55	Thomas, J., Smith, D., & Wells-Papanek, D. (2021). Studio-Based Learning Strategies Inspire Thoughtful and Purposeful Designers. In S., Cliff Sungsoo et al. (Eds.), <i>Advances in Industrial Design</i> , USA (pp. 167-176).
56	Turner, H. (2021). Effective Critique Through Affective Peer Engagement. <i>Journal of Interior Design</i> , 46(3), 29-45.
57	Vaes, K., Corremans, J., & Moons, I. (2011). Educational model for improved empathy 'the pleasurable mask experience.' In <i>International Conference on Engineering and Product Design Education</i> , London, UK.

Table A.1 (continued): 60 articles analyzed in this study.

Number	Articles
58	Wiebe, M., & Seaton, S. (2021). Art Education and Design Thinking: Reflections on Students Engaging With Community Using Design. <i>Canadian Review of Art Education</i> , 48(1), 3-19.
59	Zeivots, S., Vallis, C., Raffaele, C., & Luca, E. J. (2021). Approaching design thinking online: Critical reflections in higher education. <i>Issues in Educational Research</i> , 31(4), 1351-1366.
60	Zingoni, M. (2019). Beyond Aesthetics, Empathy First. <i>The Design Journal</i> , 22(3), 351-370.



APPENDIX B : Educational interventions x Aspects of empathy.

Table B.1 : Educational interventions x Aspects of empathy.

	Means	Competency	Scale	Strategy	Identity
Singular activities	1	6		1	
Integrations in design studio/course	17	32	2	6	3
Design project development	22	27	4	7	3
Course development	7	11		3	2
Curricula development	3	3		1	
Citizenship education development		6		1	2



APPENDIX C : Educational interventions x Contexts of empathy.

Table C.1 : Educational interventions x Contexts of empathy.

	Self- evaluation	Spatial	In-studio	Out-of- studio	Societal
Singular activities				4	
Integrations in design studio/course	2	3	6	20	
Design project development	3	2	4	22	
Course development			1	8	
Curricula development			1	2	
Citizenship education development			1	2	2



APPENDIX D : Aspects of empathy x Contexts of empathy.

Table D.1 : Aspects of empathy x Contexts of empathy.

	Means	Competency	Scale	Strategy	Identity
Self-evaluation context	5	6	5		
Spatial context	5	8		1	
In-studio context	7	19	1	7	3
Out-of-studio context	52	80		17	7
Societal context		3			2
Self-evaluation context	5	6	5		



APPENDIX E : The preliminary analysis of the articles included in review.

Table E.1 : The preliminary analysis of the articles included in review.

No	Author(s) last name, first initial	Title	Year	Journal Article	Conference Proceeding	Study Type	Extracted Data Segments	Research Terrain	Research Territory
1	Shin C. & Thomas J.	Exploring the Emotional Experience of the User and Designer, both in the Design Process and Classroom	2015	Procedia Manufacturing	6th International Conference on Applied Human Factors and Ergonomics (AHFE 2015) and the Affiliated Conferences, AHFE 2015	Empirical	Enabling students to understand user needs and their emotional phases Providing looking beyond own beliefs, values, understanding, and perceptions Developing students' lateral and design thinking Proposing an educational tool for faculty Providing engagement of students in the project Leading to develop new learning experience/environment for the students Propelling decision making processes of students in design processes Providing opportunities for the sake of design in the ideation process	Industrial design, Technology management	US
2	Gamman, L. & Thorpe, A.	Makeright—Bags of Connection: Teaching Design Thinking and Making in Prison to Help Build Empathic and Resilient Communities	2018	She Ji The Journal of Design, Economics, and Innovation		Empirical	Enabling to understand a sensitive topic, specific user and their needs Interrelating with communicate, cooperate and collaborate abilities Unlocking the learners' creativity Improving teaching materials and methods Providing insights and assets for design process	Design	UK

Table E.1 (continued): The preliminary analysis of the articles included in review.

No	Author(s) last name, first initial	Title	Year	Journal Article	Conference Proceeding	Study Type	Extracted Data Segments	Research Terrain	Research Territory
3	Davidová, M.	Multicentred Systemic Design Pedagogy Through Real-Life Empathy Integral and Inclusive Practice-Based Education in the Research-by-Design Context	2020	FormAkademisk		Empirical	Integrating in teaching Being developed by teaching through real-life design research and practice Providing learning from each others Playing a critical role in teams for the project's success Stimulating collective creativity and synergy among the people Developing students' collaborative and inclusive skills Increasing project's success and in-team support through empathic atmosphere Strengthening empathetic communication in groups, empathic interaction, dialogical cocreation and codesigning skills Empowering students to deal with environmental and social justice for responsible, responsive and empathic practices	Architecture, Environmental design, Wood engineering	UK
4	Santanichchia, M.	Architecture Education for World Citizens	2020		Schools of Thought: Rethinking Architectural Pedagogy	Empirical	Correlating with social awareness Correlating with their inner compass, their mastery, to develop confidence that is needed to then position themselves as outspoken, critical, socially aware architects Correlating with sensibility and courage to operate ethically for the greater good of the society Improving empathic and social skills to understand the conditions of the others	Architecture	Iceland
5	Altay, B. & Porter, N.	Educating the Mindful Design Practitioner	2021	Thinking Skills and Creativity		Empirical	Expanding students' empathetic horizons Correlating with the compassion towards peers Correlating with creative design thinking and wellbeing Nurturing an empathic approach towards ourselves and those we design for Creating the underlying foundation of inclusive design	Interior architecture	Turkey

Table E.1 (continued): The preliminary analysis of the articles included in review.

No	Author(s) last name, first initial	Title	Year	Journal Article	Conference Proceeding	Study Type	Extracted Data Segments	Research Terrain	Research Territory
6	Medola, F. O., Pavel, N., Baleotti, L. R., Santos, A. D. P., Ferrari, A. L. M., & Figliolia, A. C.	Phenomenological Approach to Product Design Pedagogy: A Study on Students' Experiences in Interdisciplinary and Intercultural Settings	2021	Design and Technology Education: An International Journal		Empirical	Better understanding of the user and their needs Increasing the feeling of responsibility, empathy, and willingness to help someone Correlating with gaining knowledge and developing skills of group work (communication, sharing, decision-making), improving their confidence in developing projects	Product design, Medicine	Brazil
7	Noel, L.-A.	Here's What We Really Want Your Class to be about! A Design Thinking Class Responds to the Pandemic	2021	Design & Technology Education		Empirical	Building relationships among the students studying in groups Promoting an empathetic community building with the community members Accelerating the group collaboration	Art, Engineering, Architecture, Business, Public health	US
8	Rieger, J. & Rolfe, A.	Breaking Barriers: Educating Design Students about Inclusive Design through an Authentic Learning Framework	2021	International Journal of Art and Design Education		Empirical	Increasing student empathy for people with disability Promoting effective inclusive design learning Enabling a more appropriate and sensitive design for a diverse range of users Educating future designers to be empathic and responsible global citizens	Interior design, Architecture	Australia
9	Wiebe, M. & Seaton, S.	Art Education and Design Thinking: Reflections on Students Engaging with Community Using Design	2021	Canadian Review of Art Education		Empirical	Gaining understanding of an art or design challenge Expanding the diversity and scope of potential solutions Encouraging students empathic attunement to audience Promoting more successful solutions that have a broader scope Engaging with design thinking Generating empathic ideas Engaging in the creative ideation	Art, Business	Canada

Table E.1 (continued): The preliminary analysis of the articles included in review.

No	Author(s) last name, first initial	Title	Year	Journal Article	Conference Proceeding	Study Type	Extracted Data Segments	Research Terrain	Research Territory
10	Peng, F. & Kueh, C.	Integration of Design Thinking with Cultural Intelligence in Higher Education for a Socially Complex Environment	2022	Journal of Art & Design Education		Empirical	Improving students' cultural intelligence in the context of a socially complex environment Offering a perspective on cultural diversity and communication and overcoming the language barriers in multicultural student teams Promoting design thinking as an empathetic and iterative approach Allowing students to develop insights into cultural sensitivity Enabling them to speculate about possible futures Developing a holistic understanding of the problems Correlating with metacognitive and cognitive connections Overcoming such power differences in the team Ensuring that all cultural groups have an equal opportunity to participate in the entire design process Promoting a strong foundation to speculate and imagine future opportunities that are inclusive and sustainable Engaging students in transformative, authentic learning, in non-traditional learning environments	Design	Australia

Table E.1 (continued): The preliminary analysis of the articles included in review.

No	Author(s) last name, first initial	Title	Year	Journal Article	Conference Proceeding	Study Type	Extracted Data Segments	Research Terrain	Research Territory
11	Campbell, L. H. & McDonagh, D.	Visual Narrative Research Methods as Performance in Industrial Design Education	2009	Qualitative Inquiry		Empirical	Preparing students to be researchers who are ethical, compassionate, and socially active Increasing individual consciousness Linking with performance-based pedagogy Helping students to learn for diverse or underrepresented people Attempting to uncover the various aspects of teaching about empathy Teaching empathic research methods through performance Placing student outside their own comfort zone and within the lifeworld of another person Being a quality for designers to improve the lives of others	Art, Design	US
12	Gielen, M. A.	Essential Concepts in Toy Design Education: Aimlessness, Empathy and Play Value	2009	International Journal of Arts and Technology		Discussion	Gaining understanding of users via design techniques Putting themselves mentally in the place of the child and get attuned to how children perceive their world Providing authentic and empathic insights	Industrial design	The Netherlands
13	McDonagh, D. & Thomas, J.	Disability + Relevant Design: Empathic Design Strategies Supporting More Effective New Product Design Outcomes	2010	The Design Journal		Empirical	Deepening the understanding about users who may be very different from the designer Enhancing the ability to create successful products Providing designers with more relevant data and creative product outcomes Expanding and maturing the designer's empathic horizon Positioning user an active partner within the information creation and designing process via design research strategies Ensuring more intuitive design outcomes are generated Developing design awareness and outcomes	Industrial design	US

Table E.1 (continued): The preliminary analysis of the articles included in review.

No	Author(s) last name, first initial	Title	Year	Journal Article	Conference Proceeding	Study Type	Extracted Data Segments	Research Terrain	Research Territory
14	Ho, D.K., Ma, J., & Lee, Y.	Empathy @ Design Research: A Phenomenological Study on Young People Experiencing Participatory Design for Social Inclusion	2011	CoDesign		Empirical	Providing more opportunities to understand users' experience Helping to understand user experience Providing feasible ways to form mutual understanding and intersubjectivity Providing the conditions for advancing individual knowledge and experience	Design	China
15	Mendoza, H.R., & Matyók, T.	Designing Student Citizenship: Internationalised Education in Transformative Disciplines	2013	International Journal of Art and Design Education		Empirical	Allowing individuals to transcend provincial boundaries and engage the world, expand their worldviews Growing through democratic engagement Supporting cultural perceptions, global discourse Promoting empathic relationships, empathic civilisation, and global citizenship	Interior architecture	US
16	Altay, B.	User-centered Design through Learner-centered Instruction	2014	Teaching in Higher Education		Empirical	Indicating the ability to see the environment from the eyes of the diverse user Increasing awareness of how diverse people experience the environment Increasing empathic understanding Developing emotional connection with diverse users	Interior architecture and environmental design	Turkey
17	Altay, B. & Demirkan, H.	Inclusive Design: Developing Students' Knowledge and Attitude through Empathic Modelling	2014	International Journal of Inclusive Education		Empirical	Enhancing student engagement in the course Supporting the development of cognitive and affective learning Supporting inclusive design education Changing students' perceptions of their everyday environment Increasing understanding about disabled people Promoting students' awareness of inclusive design	Interior architecture and environmental design	Turkey

Table E.1 (continued): The preliminary analysis of the articles included in review.

No	Author(s) last name, first initial	Title	Year	Journal Article	Conference Proceeding	Study Type	Extracted Data Segments	Research Terrain	Research Territory
18	Annemans, M., Van der Linden, V., Karanastasi, E. & Heylighen, A.	Learning to Shape Places of Care by Empathising with Patients and Caregivers	2015		Raising Awareness for the Societal and Environmental Role of Engineering and (Re)Training Engineers for Participatory Design (Engineering4Society)	Empirical	Understanding users and their needs and wants of future users of the cancer caring centre who would use the building being designed Embracing empathy as a mind-set and an attitude towards people	Architecture	Belgium
19	McDonagh, D.	Design Students Foreseeing the Unforeseeable: Practice-based Empathic Research Methods	2015	International Journal of Education through Art		Empirical	Expanding understanding related to users Offering research and social skills to help close the knowledge gap between the user and designer Encouraging design students to be agile and flexible in their thinking Preparing them for emerging and future needs of users Encouraging mindfulness Preparing them for professional expectations Contributing to the design student's skillset and mindset Shaping their mindset in terms of ageing, disability and emotional needs of users	Industrial design	US
20	Pezeshki, C., Leachman, J., & Creston, S.C.	Merging Engineering and Art What are the Real Lessons?	2015		International Conference on Interactive Collaborative Learning (ICL)	Empirical	Increasing empathetic connections in student teams Correlating the social structure of project and forcing perspective-taking of the various parties	Mechanical engineering, Clinical art	US

Table E.1 (continued): The preliminary analysis of the articles included in review.

No	Author(s) last name, first initial	Title	Year	Journal Article	Conference Proceeding	Study Type	Extracted Data Segments	Research Terrain	Research Territory
21	Altay, B., Ballice, G., Bengisu, E., Alkan-Korkmaz, S., & Paykoç, E.	Embracing Student Experience in Inclusive Design Education through Learner-centred Instruction	2016	International Journal of Inclusive Education		Empirical	Developing design abilities Encompassing an understanding of the user group, and establishing its foundations in education Engaging with potential users and providing design solutions Increasing inclusive design awareness Embodying strategies in inclusive design education Supporting design awareness and encouraging reflection on design outcomes	Architecture, Interior design	Turkey
22	Altay, B.	Developing Empathy towards Older Adults in Design	2017	Educational Gerontology		Empirical	Making connections with potential design users Understanding the elderly perspective Developing students' empathic understanding within design education Expanding students' empathic horizons and becoming immersed Promoting implications for empathic design education and educational gerontology Providing a basis for further communication in professional life	Interior architecture and environmental design	Turkey
23	Altay, B.	Multisensory Inclusive Design Education: A 3D Experience	2017	The Design Journal		Empirical	Developing an understanding towards disabled people Making students aware of difficulties encountered in the limitations of physical environment Expanding the depth, scope, and implementation of ergonomics discipline Affecting students understanding and awareness of, and attitudes towards, inclusive design, as well as creative thinking	Interior architecture and environmental design	Turkey

Table E.1 (continued): The preliminary analysis of the articles included in review.

No	Author(s) last name, first initial	Title	Year	Journal Article	Conference Proceeding	Study Type	Extracted Data Segments	Research Terrain	Research Territory
24	Chmela-Jones, K.A.	Flourishing in Graphic Design Education: Incorporating Ubuntu as a Curricular Strategy	2017	The Design Journal	Design for Next 12th EAD Conference	Empirical	Increasing the interest for others and understanding their needs and desires of users Intertwining with civic engagement and democratic action Reflecting on students' design outcomes correlating with social and cultural values, community engagement	Graphic design	South Africa
25	de Vere, I. & Daniel, C.	Social Innovation in the Curriculum: A Model for Community Engagement and Design Intervention	2017		21st International Conference on Engineering Design	Empirical	Developing students' engagement skills Delivering cost effective and viable empathetic solutions Developing empathy and understanding the needs of end users Establishing understanding about marginalised groups	Design	UK
26	Brueggemann, M.J., Strohmayer, A., Marshall, M., Birbeck, N. & Thomas, V.	Reflexive Practices for the Future of Design Education: An Exercise in Ethno-Empathy	2017	The Design Journal	Design for Next 12th EAD Conference	Reflective	Inviting the development of a safe, reflexive, a shared language amongst peers Promoting ethical and sensitive acting Eliminating any conceptual distinctions between researcher and target community Inviting to think with stakeholders and acknowledging to be a part of the stakeholder group	HCI	UK
27	Christian, C.	Contemplative Practices and Mindfulness in the Interior Design Studio Classroom	2018	Journal of Interior Design		Empirical	Correlating with the engagement of students in studio projects Reducing mindless thinking Cultivating creativity Encouraging understanding for all users and the project impacts Promoting a clear, unbiased, and unfiltered observation of the context Promoting a sense for others and interconnectedness Cultivating the empathic design concepts Correlating a responsible, creative, and empathetic professional interior design practice Helping to see design problems in new ways and be more critical of their surroundings by reducing assumptions	Interior design	US

Table E.1 (continued): The preliminary analysis of the articles included in review.

No	Author(s) last name, first initial	Title	Year	Journal Article	Conference Proceeding	Study Type	Extracted Data Segments	Research Terrain	Research Territory
28	Lopez-Leon, R. & Valdez, G.G.	Understanding Empathy in Design Education	2018	International Journal of Educational Research and Innovation		Empirical	Motivating students to become empathetic with socially-driven design projects by an empathic approach of teachers Developing empathic designers Providing students with a suitable environment for developing empathy Promoting empathic relationship and moments between teacher and student Providing empathic development of education Promoting willingness of teacher for understand students' moods	Industrial design, Graphic design	Mexico
29	Lorentzen, L. & Hedvall, P.-O.	Bringing Human Diversity into Design Processes Through Empathic Modelling	2018		Universal Design and Higher Education in Transformation Congress (UDHEIT2018)	Empirical	Increasing the level of innovation in design works Leading to teach universal design Providing understanding about design for human diversity into account in design processes Making students very engaged Promoting to find new solutions to the problems	Design	Sweden
30	Medola, F.O., Sandnes, F.E., Ferrari, A.L.M. & Rodrigues, A.C.T.	Strategies for Developing Students' Empathy and Awareness for the Needs of People with Disabilities: Contributions to Design Education	2018	Studies in Health Technology and Informatics	Universal Design and Higher Education in Transformation Congress (UDHEIT2018)	Empirical	Developing awareness for the needs and expectations of people with disabilities Locating students in the position of the user and better equipped them to understand the difficulties and feelings during use Providing students' engagement with the course Developing teaching and pedagogical strategies and techniques	Design, Architecture, Visual art	Brazil
31	Haag, M. & Marsden, N.	Exploring Personas as a Method to Foster Empathy in Student IT Design Teams	2019	International Journal Technology and Design Education		Empirical	Providing to get emotionally involved Encouraging empathy in design process Incorporating awareness of social processes Affecting in-group and personal identity construction	Information technology	Germany

Table E.1 (continued): The preliminary analysis of the articles included in review.

No	Author(s) last name, first initial	Title	Year	Journal Article	Conference Proceeding	Study Type	Extracted Data Segments	Research Terrain	Research Territory
32	Zingoni, M.	Beyond Aesthetics Empathy First	2019	The Design Journal		Empirical	Understanding designing and making for others with differing realities Leading to development of empathy as a teaching objective Improving students' emotional skills and students' perceptions of the value of the discipline beyond aesthetics Leading students to develop an empathic response Leading to creative act Valuing the profession Leading to become better designers Improving empathetic skills Improving the sense of accomplishment as designers early in their academic path Provoking positive student learning outcomes	Interior design	US

Table E.1 (continued): The preliminary analysis of the articles included in review.

No	Author(s) last name, first initial	Title	Year	Journal Article	Conference Proceeding	Study Type	Extracted Data Segments	Research Terrain	Research Territory
33	Carlson, J.D. & Dobson, T.	Fostering Empathy through an Inclusive Pedagogy for Career Creatives	2020	iJADE		Empirical	Encouraging learners to explore social issues Bolstering a sense of belonging by bringing students closer together Promoting awareness in group critique and collaboration Inspiring students to share out their newly acquired passion for helping others through creativity Fostering deeper reflection and critical thinking Encouraging learners to open up about their individual process, personal thoughts and feelings with peers Fostering a mindset by pedagogical triggers Being a base of the learning pyramid Promoting a pedagogy as transforming twenty-first century learning Engaging in collaborative problem solving and creative challenges Increasing emotional intelligence Raising awareness to issues of social injustice Creating empathic careers, employees and citizens Mediating empathic pedagogy and empathy as pedagogical deliverable Equipping and preparing learners for this future workplace	Art, Graphic design	US
34	Alzayed, M.A., McComb, C., Menold, J., Huff, J., & Miller, S.R.	Are You Feeling Me? An Exploration of Empathy Development in Engineering Design Education	2021	Journal of Mechanical Design		Empirical	Developing students' traits, awareness, and self-efficacy Being affected by the course instructor for empathy development	Engineering design	US

Table E.1 (continued): The preliminary analysis of the articles included in review.

No	Author(s) last name, first initial	Title	Year	Journal Article	Conference Proceeding	Study Type	Extracted Data Segments	Research Terrain	Research Territory
35	Alzayed, M.A., Miller, S.R., & McComb, C.	Empathic Creativity: Can Trait Empathy Predict Creative Concept Generation and Selection?	2021	Artificial Intelligence for Engineering Design, Analysis and Manufacturing		Empirical	Promoting creative concept generation and selection Impacting idea selection Impacting the number of ideas generated	Engineering design	Kuwait
36	Swaranjali, P., Patel, T., & Espersen-Peters, K.	Next Time, with Empathy: Revisiting the Studio Pedagogy for Transitional Housing for Refugees	2021	Archnet-IJAR: International Journal of Architectural Research		Empirical	Promoting student engagement, authentic and cross-cultural learning Acquiring transformative attitude towards design Using as a learning tool for transforming the student designer's mindset Getting a socially determined position Identifying and understanding the situation of the user group Promoting engagement and reflection as pedagogical goals Shifting the pedagogical goals by integrating empathic design into the studio curriculum Promoting to restructure learning objectives and assignments Contextualizing new design strategies Helping to reframe of the problem to make an authentic design solution Developing toolkits to provide thinking strategies	Interior design	Canada

Table E.1 (continued): The preliminary analysis of the articles included in review.

No	Author(s) last name, first initial	Title	Year	Journal Article	Conference Proceeding	Study Type	Extracted Data Segments	Research Terrain	Research Territory
37	Şenyiğit, Ö. & Yılmaz, N.	An Awareness Experience by Empathic Design Method in Architectural Design Education	2021	International Journal of Architecture and Planning		Empirical	Increasing students' awareness and sensitivity for subjects of universality Transferring the emotional and social dimensions to the designer candidate Developing the awareness of students in the creation process and perspectives Acquiring user experiences who have special physical needs Developing empathizing skills for students Integrating with universal design education Helping to transfer user experiences to design Developing designer's ability to think together with the user	Architecture Interior design	Turkey
38	Turner, H.	Effective Critique Through Affective Peer Engagement	2021	Journal of Interior Design		Empirical	Correlating with interpersonal relationships, collaboration, communication, which requires a pairing and balance of cognitive with affective skills Correlating with peer-critique process	Interior design	US
39	Zeivots, S., Vallis, C., Raffaele, C., & Luca, E.J.	Approaching Design Thinking Online: Critical Reflections in Higher Education	2021	Issues in Educational Research		Reflective	Interacting with user to understand their points of view Associating with design thinking Facilitating engaging environment Encouraging educators to experiment and to recognise the realities of students' lives and those around them Supporting learners and creating a space for collaboration and reflection	Multidisciplinary	Australia
40	Boess, S., Saakes, D. & Hummels, C.	When is Role Playing Really Experiential?: Case Studies	2007		TEI'07: First International Conference on Tangible and Embedded Interaction	Empirical	Enabling empathic transfer from research to design ideation Respecting to social change and accessing user research data	Interaction design	The Netherlands

Table E.1 (continued): The preliminary analysis of the articles included in review.

No	Author(s) last name, first initial	Title	Year	Journal Article	Conference Proceeding	Study Type	Extracted Data Segments	Research Terrain	Research Territory
41	Malins, J. & McDonagh, D.	A Grand Day Out: Empathic Approaches to Design	2008		New perspectives in design education: Proceedings of the Engineering and Product Design Education Conference	Discussion	Bringing new design perspectives Building synergy of individuals, developing relationships and embracing subjectivity for its positive values Teaching empathic design thinking to new designers Developing deep understanding about user and their needs	Design	UK
42	Lee, J.-J., Vaajakallio, K., & Mattelmäki, T.	Tracing Situated Effects of Innovative Design Methods: Inexperienced Designers' Practices	2011		DESIRE'11 Conference on Creativity and Innovation in Design	Empirical	Having confidence for creatively employing the methods and for deciding design solutions Supporting students for empathic learning and design inspiration Promoting students to build empathic mindset Leading to the key design driver of the students' final design concept Gaining understanding of users and design inspiration	Industrial design, Cognitive and computer science	Finland
43	McDonagh, D., Thomas, J., & Strickfaden, M.	Empathic Design Research: Moving Towards a New Mode of Industrial Design Education	2011	Design Principles and Practices: An International Journal		Empirical	Considering user needs to support innovative product development Enhancing design processes and contributing to design outcomes Playing a role in the development of successful products Leading to develop meaningful design outcomes Leading to the development of more appealing products Promoting cooperation, partnership, and teamwork among the participants Supporting opportunities to develop skills related to communication and interaction Emphasizing emotional and conceptual skill development Leading to develop new ways of observation and critical thinking	Industrial design	US

Table E.1 (continued): The preliminary analysis of the articles included in review.

No	Author(s) last name, first initial	Title	Year	Journal Article	Conference Proceeding	Study Type	Extracted Data Segments	Research Terrain	Research Territory
44	Vaes, K., Corremans, J., & Moons, I.	Educational Model for Improved Empathy "The Pleasurable Mask Experience"	2011		International Conference on Engineering and Product Design Education	Empirical	Ensuring the emotional awareness Creating empathic awareness Boosting the students' creative and research skills Incorporating in the different phases of the design exercise (analyses – creation – verification)	Product development	Belgium
45	de Vere, I. & Phillips, R.	Using Social Engagement to Inspire Design Learning	2015		International Conference on Engineering and Product Design Education	Empirical	Enhancing student learning Understanding a community spirit Understanding for societal and environmental contexts Understanding the needs of end users	Industrial design, Product design engineering	UK
46	Schmitt, E., Kames, E. & Morkos, B.	The Importance of Incorporating Designer Empathy in Senior Capstone Design Courses	2016		ASEE Annual Conference and Exposition, Conference Proceedings	Empirical	Eliciting accurate requirements and develop solutions that meet the needs of the customer by using designer empathy tools Involving target users throughout the entire design process Helping designers understand the needs of the end-user Teaching students various empathy tools and methods Affecting on the elicitation phase of the project Impacting on student's ability to traverse and successfully complete the design process Promoting design tools and methods utilized to support designer empathy by design educators Affecting on the design process and final product	Biomedical, Mechanical engineering	US
47	Bell-Huff, C. & Morano, H. L.	Using Simulation Experiences, Real Customers, and Outcome Driven Innovation to Foster Empathy and an Entrepreneurial Mindset in a Sophomore Engineering Design Studio	2017		ASEE Annual Conference and Exposition, Conference Proceedings	Empirical	Understanding the everyday experiences of people with disabilities Developing entrepreneur mindset	Engineering	US

Table E.1 (continued): The preliminary analysis of the articles included in review.

No	Author(s) last name, first initial	Title	Year	Journal Article	Conference Proceeding	Study Type	Extracted Data Segments	Research Terrain	Research Territory
48	Lopez-Neri, E., Gomez-Davila, J.A., & Carlos-Mancilla, M.	CiudadelaS IM Urban Modeling Framework and Human-centered Design (HCD) Learning based Approaches: A Pedestrian Mobility Case Study in Monterrey, Mexico	2018	Interaction Design and Architecture(s) Journal		Empirical	Promoting a learning methodology and a motivational concept in educational systems Developing empathic classroom climates and facilitating learning Making a positive contribution in skills and competencies, interpersonal relationships or social cohesion, socialization, learning processes, team working, sense of community, creativity, organization, environment awareness	Graphic design, Architecture	Mexico
49	Mitchell, L., & Light, L.	Increasing Student Empathy through Immersive User Empathy Experiences in First-year Design Education	2018		ASEE Annual Conference and Exposition, Conference Proceedings	Empirical	Embedding into students' problem-solving endeavours Promoting explicit teaching incorporating empathy Promoting personal connection and deeper understanding about users' situation Seeing the direct benefits and applications to their work Leading more realistic and meaningful solutions	Engineering design	US
50	Siqueira da Silva, I.S.	The Promotion of Empathy for the Experience of Users with Visual Impairment in the Game Design Education	2019		21st HCI International Conference	Empirical	Understanding the target audience, their needs and expectations	Game design	Brazil
51	Alzayed, M.A., Milleri S.R., Menold, J., Huff, J., & McComb, C.	Can Design Teams be Empathically Creative? A Simulation-based Investigation on the Role of Team Empathy on Concept Generation and Selection	2020		ASME 2020 International Design Engineering Technical Conferences	Empirical	Developing a deeper understanding of the users' needs Impacting team performance Impacting on team empathy on engineering design outcomes Impacting teams' unique idea generation and selection positively	Engineering design	US

Table E.1 (continued): The preliminary analysis of the articles included in review.

No	Author(s) last name, first initial	Title	Year	Journal Article	Conference Proceeding	Study Type	Extracted Data Segments	Research Terrain	Research Territory
52	Cordan, O., Dincay, D.A., Yurdakul Tokur, Ç., Oksuz, E.B., & Vayvay, G.	Exploring Universal Design Principles within a PUDCAD Project: Local Workshops in Turkey	2020	The International Journal of Design Education		Empirical	Understanding of the people with special needs	Interior design, Occupational therapy	Turkey
53	Natu, A.	Integrating Behavioral Research in Undergraduate Design Studio in Architecture for Designing Inclusive Environments	2020	Journal of Accessibility and Design for All		Empirical	Understanding the needs of the elderly persons and were sensitised to the social issue of exclusion of the elderly	Landscape and architecture	India
54	Roja, J.-C., Muniz, G., & Higuera-Trujillo, J. L.	Emotional Tools Design: A Project to Increase Empathy, Engagement and Interest in Industrial Design Students	2020		ASME 2020 International Mechanical Engineering Congress and Exposition	Empirical	Being an educational dynamic Adopting certain skills or competencies to empathize with people Cultivating as a skill in students who design products, services or creative solutions Correlating with emotions as a communication channel Cultivating empathy skills in design and engineering	Industrial design, Mechanical and mechatronic engineering	Mexico
55	de Freitas, A. P. N., & Almendra, R. A.	What if...? Strategies to Teaching Communication, Empathy and Teamworking for Design Students by Design Students	2021		AHFE 2021 Virtual Conferences on Design for Inclusion, Affective and Pleasurable Design, Interdisciplinary Practice in Industrial Design	Empirical	Being a soft skill important for design together with communication and team working skills Connecting teachers and students	Architecture	Portugal

Table E.1 (continued): The preliminary analysis of the articles included in review.

No	Author(s) last name, first initial	Title	Year	Journal Article	Conference Proceeding	Study Type	Extracted Data Segments	Research Terrain	Research Territory
56	Kakoun, N.A., Boy, F., & Xavier, P.	Are Civil Engineers "Practicing What They Preach?"	2021		2021 American Society for Engineering Education	Empirical	Facilitating their imagination and understanding of the peoples' situations and needs Reminding students of the impact of their designs, and their responsibility as engineers, to produce designs and solutions	Civil engineering	UK
57	Prabhu, R., Alzayed, A. M., & Starkey, E. M.	Not Good Enough? Exploring Relationships between Students' Empathy, Their Attitudes towards Sustainability, and the Self-perceived Sustainability of Their Solutions	2021		ASME 2021 International Design Engineering Technical Conferences and Computers and Information in Engineering Conference	Empirical	Influencing their emphasis on sustainability especially in the concept evaluation stage Promoting the ability to understand environmental issues Being potentially more critical for their solutions Adopting a sustainable mindset Perceiving others' needs Influencing the idea generation and selection stages of the design process Helping to see the flaws and shortcomings in their solutions Influencing the attitudes towards sustainability Influencing designers' confidence in their design decisions, which can be an indicator of future success	Engineering design	US
58	Prabhu, R., Starkey, E. M., & Alsagerb, A. M.	Student Reflections on Sustainability and Empathy: The Outcomes of a Sustainability Workshop in First-year Design Courses	2021		ASEE Annual Conference and Exposition, Conference Proceedings	Empirical	Determining designers' ability to successfully understand the needs of the user Encouraging a sustainable design mindset Influencing the attitudes towards sustainability Understanding users' needs, and generating creative solutions to meet these needs Influencing the stage of the design process positively	Engineering design	US

Table E.1 (continued): The preliminary analysis of the articles included in review.

No	Author(s) last name, first initial	Title	Year	Journal Article	Conference Proceeding	Study Type	Extracted Data Segments	Research Terrain	Research Territory
59	Thomas, J., Chen, X., Lee, I., Wang, J., Yang, Y., & Strickfaden, M.	Learning Design Thinking Through a Collaborative Focus on Social Justice	2021		AHFE 2021 Virtual Conferences on Design for Inclusion, Affective and Pleasurable Design, Interdisciplinary Practice in Industrial Design, Kansei Engineering, and Human Factors for Apparel and Textile Engineering	Empirical	Allowing individuals to better understand user experience and realize their real requirements Struggling with these social justice issues	Engineering, Architecture and psychology, Environmental , Graphic, and Industrial design	US
60	Thomas, J., Smith, D., Wells-Papanek, D.	Studio-Based Learning Strategies Inspire Thoughtful and Purposeful Designers	2021		AHFE 2021 Virtual Conferences on Design for Inclusion, Affective and Pleasurable Design, Interdisciplinary Practice in Industrial Design, Kansei Engineering, and Human Factors for Apparel and Textile Engineering	Empirical	Understanding people who designing with & for, from diverse points of view Improving understanding and attitudes at the intersection of design and social justice	Graphic and industrial design	US

APPENDIX F : Three themes of design teachers' empathic perspective-taking towards design students, users and materials.

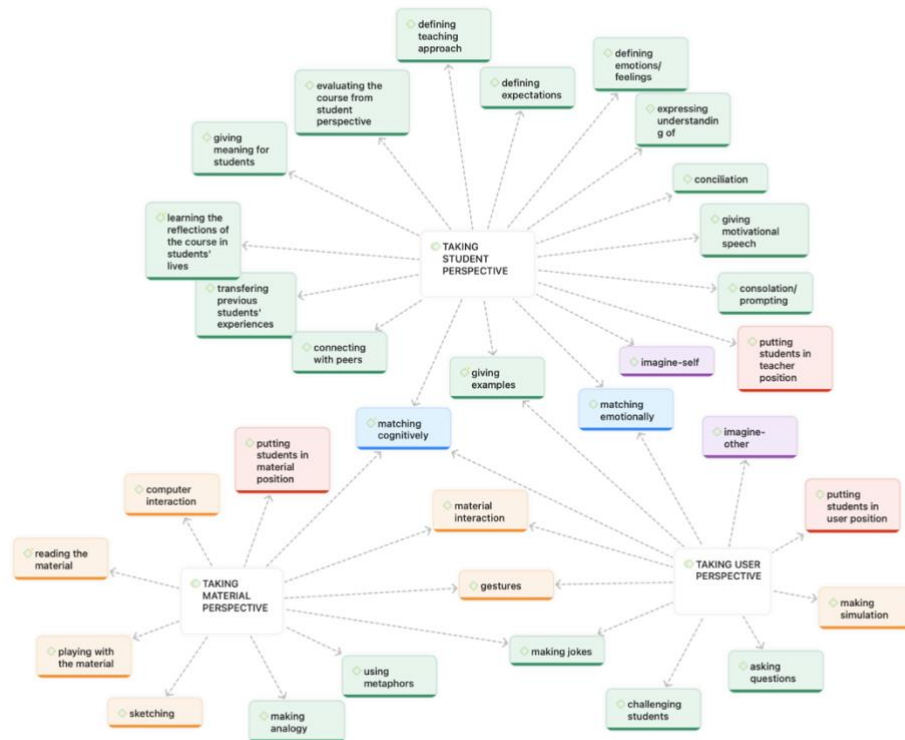


Figure F.1 : Three themes of design teachers' empathic perspective-taking towards design students, users and materials.



APPENDIX G : Two themes around empathic deliveries such as discursive and performative.

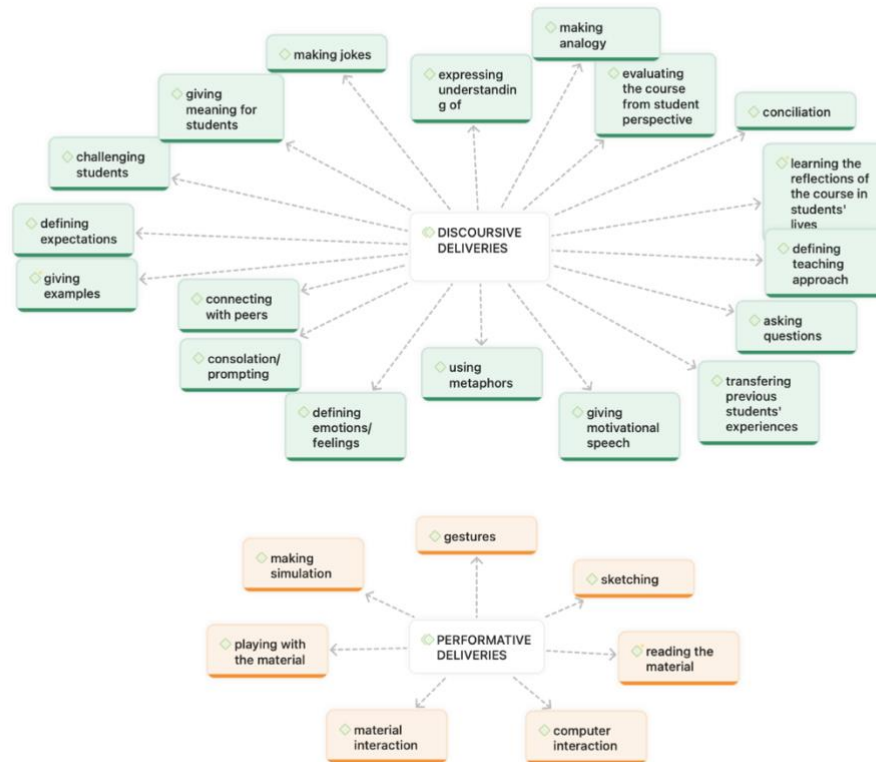


Figure G.1 : Two themes around empathic deliveries such as discursive and performative.



APPENDIX H : Ethics committee approval.

İSTANBUL TEKNİK ÜNİVERSİTESİ
SOSYAL VE BEŞERİ BİLİMLER İNSAN ARAŞTIRMALARI ETİK KURULU
DEĞERLENDİRME SONUCU

PROJE NUMARASI: 338 **TARİH: 30.03.2023**

1.	Projenin Adı ve Yürütücüsü: Tasarım pedagojisinde katılımcı tasarım anlayışı: Tasarım eğitmenlerinin empatik yaklaşımları üzerinden model ve araç geliştirme Dr. Öğr. Üyesi Koray Gelmez Araş. Gör. Pelin Efiliti
2.	Projenin Amacı (azami 100 kelime) : Tasarım alanındaki kullanıcı araştırmaları kapsamında güncel bir konu haline gelen empatinin, tasarım öğrenimi ve öğretim süreçleri ile olan bağlantısının ele alınması önemlidir. İlgili literatür incelendiğinde empatinin, öğrenme süreçlerine olan etkisi ve önemine rağmen, eğitmenlerin empatik yaklaşımlarının tasarım eğitimi bağlamında detaylı bir şekilde ele alınmamış olduğu ve bu konunun araştırmaya açık bir alan olduğu anlaşılmaktadır. Bu çalışma, tasarım eğitmenlerinin (a) öğrencilere, (b) tasarım çalışmalarına ve (c) kullanıcılara yönelik empatik yaklaşımlarını anlamayı hedeflemektedir.
3.	Projenin Yöntemi (azami 100 kelime) : Metodolojik olarak katılımcı tasarım yaklaşımını benimseyen bu çalışma kapsamında, “yarı-yapılandırılmış görüşme” ve “empatik günlük” yöntemlerinin yürütülmesi planlanmaktadır. Yarı-yapılandırılmış görüşmeler, tasarım eğitmenlerinin empati konusundaki görüşlerine dayanacaktır. Empatik günlük çalışması ise tasarım eğitimindeki empatik etkileşimler, yaklaşımlar ve anlayışlar hakkında bilgi toplamayı amaçlamaktadır ve tasarım eğitmenlerinin aktif katılımı ve kendi deneyimlerini belgelemeleri ile yürütülmesi planlanmaktadır.

☒ Proje değerlendirilmiş ve etik açıdan uygun BULUNMUŞTUR.
☐ Proje değerlendirilmiş ve etik açıdan uygun BULUNMAMIŞTIR.
☐ Proje değerlendirilmiş ve etik kurul belgesine GEREK DUYULMAMIŞTIR.

Figure H.1 : Ethics committee approval.



APPENDIX I : Invitation form of the pedagogical study.

Let's take a new perspective! A probe kit on design teaching

This research aims to understand the **empathic perspective-taking practices in design teaching**. This study includes particular tasks and questions related to your teaching approach. It will last 5 days and will take approximately 10-15 minutes everyday.

- In the first day, we aim to understand how you conceptualize empathy and how you practice design conversations with students in design courses.
- From the second to the fourth day, there will be imaginative scenarios and tasks related to your perspective-taking practices.
- In the last day, you will evaluate the tasks you practiced during this study.

If you agree to participate in this study, you will receive two e-mails or WhatsApp/Telegram messages from the researcher everyday for the next five days. These e-mails/messages will be the same links including that day's tasks and questions. The first will be in the mornings around 10 a.m. and the other will be in the afternoons around 6 p.m. to remind you to complete the tasks and questions before the day ends.

Information about the researcher

Hello, I am **Pelin Efilti**.
I'm a PhD. Candidate and Research Assistant at Istanbul Technical University, Türkiye and a Visiting Researcher at Aalto University, Finland. My doctoral thesis is about the empathic perspective-taking of design teachers in design courses (workshop, studio, project, lab, etc.). My research interests are participatory design research, human-centred design, design education and pedagogy.

I will be very appreciate it if you volunteer to contribute to this study with your unique teaching experiences:)

Information about the research

This research study is a part of the doctoral thesis of Pelin Efilti, which is supported by Scientific Research Projects Coordination Unit of Istanbul Technical University (ITU) (Grant number: MDK-2022-44057). For this study, the researcher (Pelin Efilti) is awarded by The Scientific and Technological Research Council of Türkiye (TUBITAK) International Fellowship and Tinçel Kültür Vakfı International Fellowship.
This study has an ethical approval from ITU Ethical Committee (Project No:338)

If you are willing to participate in this research, please confirm the box below. *
Your information will be anonymised and only be used for academic purposes.
You can leave at any time during the study.

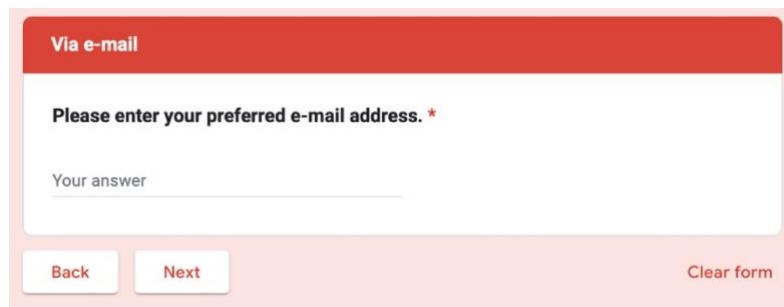
☐ I volunteer to participate.

How would you like me to get in touch with you during this study?

☐ Via e-mail
☐ Via WhatsApp message
☐ Via Telegram message

[Next](#) [Clear form](#)

Figure I.1 : Invitation form of the pedagogical probe study (Welcome page).



The image shows a web form with a red header bar containing the text "Via e-mail". Below the header, there is a white box with the instruction "Please enter your preferred e-mail address. *". Underneath this instruction is a text input field with the placeholder text "Your answer". At the bottom of the form, there are three buttons: "Back", "Next", and "Clear form". The "Back" and "Next" buttons are white with red text, while the "Clear form" button is red with white text.

Figure I.2 : Invitation form of the pedagogical probe study (Preferred communication channel page).

Information about yourself

In this part of the study, we aim to collect your occupational information and understand your ongoing design course practices.

Your name *

Your answer

Your department *

Your answer

Your teaching experience (as a year) *

Choose

Which courses are you teaching now? *

Your answer

What grades are you teaching now? *

- ☐ 1. grade (Bachelor's Programme)
- ☐ 2. grade (Bachelor's Programme)
- ☐ 3. grade (Bachelor's Programme)
- ☐ 4. grade (Bachelor's Programme)
- ☐ Master's Programme
- ☐ Doctoral Programme
- ☐ None

What kind of design projects are you running in your courses now, could you write the topics briefly?

Your answer

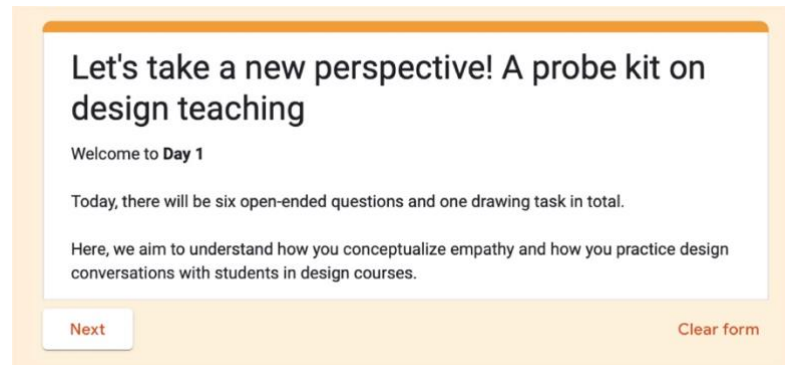
That's all for today.
See you in the next five days:)

Back Submit Clear form

Figure I.3 : Invitation form of the pedagogical probe study (Occupational data page).



APPENDIX J : The form of Day 1.



Let's take a new perspective! A probe kit on design teaching

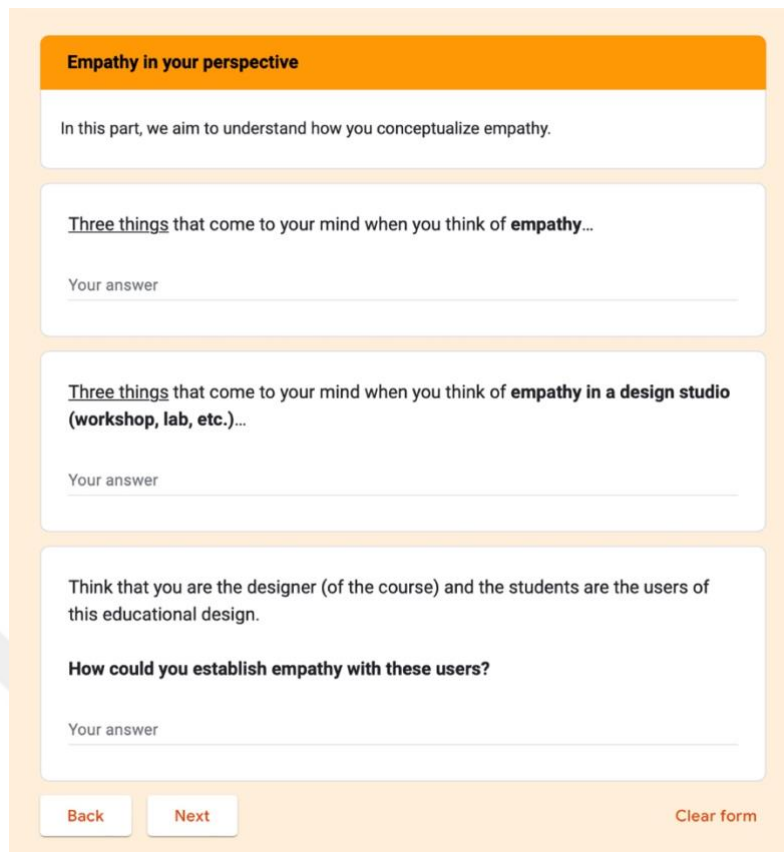
Welcome to **Day 1**

Today, there will be six open-ended questions and one drawing task in total.

Here, we aim to understand how you conceptualize empathy and how you practice design conversations with students in design courses.

[Next](#) [Clear form](#)

Figure J.1 : The form of Day 1 (Welcome page).



Empathy in your perspective

In this part, we aim to understand how you conceptualize empathy.

Three things that come to your mind when you think of **empathy**...

Your answer

Three things that come to your mind when you think of **empathy in a design studio (workshop, lab, etc.)**...

Your answer

Think that you are the designer (of the course) and the students are the users of this educational design.

How could you establish empathy with these users?

Your answer

[Back](#) [Next](#) [Clear form](#)

Figure J.2 : The form of Day 1 (Empathy in your perspective page).

Design conversations in your practice

In this part, we aim to understand your design conversation experiences in general.

Design conversations between design teachers and students are based on design critiques (one-on-one critiques, group critiques, etc.) and design juries (interim and final juries).

Three most important features of empathic design conversation are...

Your answer

By drawing today's classroom plan (or remember your recent class plan), could you indicate the places of yourself, students, materials, representations, and other agencies during design conversations?

You can draw on a piece of paper, take and upload the photo of it. Or you can draw digitally on your phone or computer and upload it.

[Add File](#)

Could you also explain **how these agencies affect the conversation**?

Your answer

Perspective-taking is putting yourself into particular position, human or nonhuman, in a word, identifying yourself with another agency.

Try to remember your ongoing or recent design conversations with students.
Please list human and non-human agencies during design conversations you put yourself into.

Your answer

Thank you for your contribution.
See you tomorrow :)

[Back](#)

[Submit](#)

[Clear form](#)

Figure J.3 : The form of Day 1 (Design conversation in your practice page).



APPENDIX K : The form of Day 2.



The image shows a digital form titled "Let's take a new perspective! A probe kit on design teaching". The form is set against a light green background. The main content area is white with a green border. It contains a welcome message for Day 2, an introduction to the design project scenario, and instructions for the next three days. At the bottom, there are two buttons: "Next" and "Clear form".

Let's take a new perspective! A probe kit on design teaching

Welcome to **Day 2**

Today, we present to you an imaginative design project scenario you are running as a design teacher.

In the next three days, you will identify yourselves with different agencies according to this scenario and will have a design conversation with a design student.

Don't worry, we will give this scenario everyday.

[Next](#) [Clear form](#)

Figure K.1 : The form of Day 2 (Welcome page).

Design project and your critiques

Please immerse yourself into this scenario, you can fill the gaps in your minds imaginatively.

Imagine that you carry out a design project in your design studio/course/workshop/lab, which aims to design a foldable and portable pencil case for primary school age children between 7-10 that can be used at both home and school. The pencil case should contain ten 20cm length pens and two erasers (4x2x1cm dimensions).

You are in a collaboration with a company recycling plastic and producing 2mm plastic sheet materials, so it should be produced by those sheet materials particularly. In addition to this, design students can only use zippers as a connection material.

In this project, you also have a primary school stakeholder. Design students can visit the school to observe the practices of children and teachers, as well as the environment. They also conduct user research and collaborative design sessions through different methods such as conducting domestic probes or workshops, organizing surveys, interviewing with children, teachers, and parents, etc. and present you.

The outcomes of this design project will be the prototypes in minimum material use and cost. They should be produced by the company with basic form-giving techniques such as folding, cutting, twisting, etc. They should also be stacked with minimum space loss for a sustainable distribution process. The company will produce and distribute the pencil holders for the needs of children in rural areas as a social responsibility project. You also conducted this design project in your previous semesters with different student groups.

Think that you are in a design conversation with one of the design students in the course. He/she is in the concept development phase and shows you his/her research findings, sketches, and initial models. Your conversation includes sharing the experiences and decisions specific to his/her design process. According to his/her user research and practices observed, his/her design concept is to ease the sorting of pens according to children's needs as well as to increase the access of pens inside the backpacks or on the tables. His/her first idea and model are to create a 25cm length and 5cm diameter cylindrical form that enables accession from both sides of the circles by zippers. He/she also tries to create particular compartments for sorting the pens. He/she tries to solve how the pens can be picked, inserted, and organized easily by children from this small space and the immobilization of the compartments. He/she also has problems with the production method of this form, the use of zippers in such a short radial area and the cost of combining multi pieces of the product such as lids, body, compartments.

Therefore, the student mentions his/her difficulties to develop the concept and form as well as to use the sheet material with all these challenges. He/she also mentions his/her unsatisfactory and problematic design project experiences that happened before.

A sketch of the student.

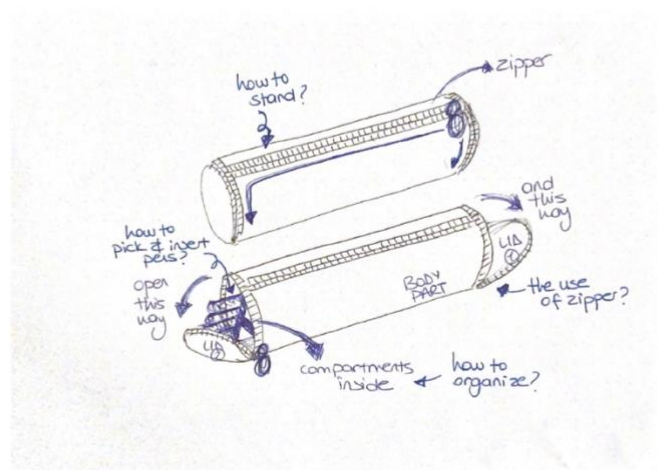


Figure K.2 : The form of Day 2 (Design project and your critique page).



Give yourself a minute and imagine that you are this student mentally and emotionally.
Now, you would like to show that you understand him/her, his/her concerns, and problems particularly. Think that you will give a design critique from the perspective of this student.

What would you say?
Imagine the main points of the critique and please write in detail (you may want to record your voice instead of writing - please upload it to the next file).

Your answer _____

Please upload your voice record here, if you have one.

[📎 Add File](#)

How would you act?
Imagine your bodily performances and could you please describe in detail (you may draw your bodily performances if it is possible - please upload it to the next file).

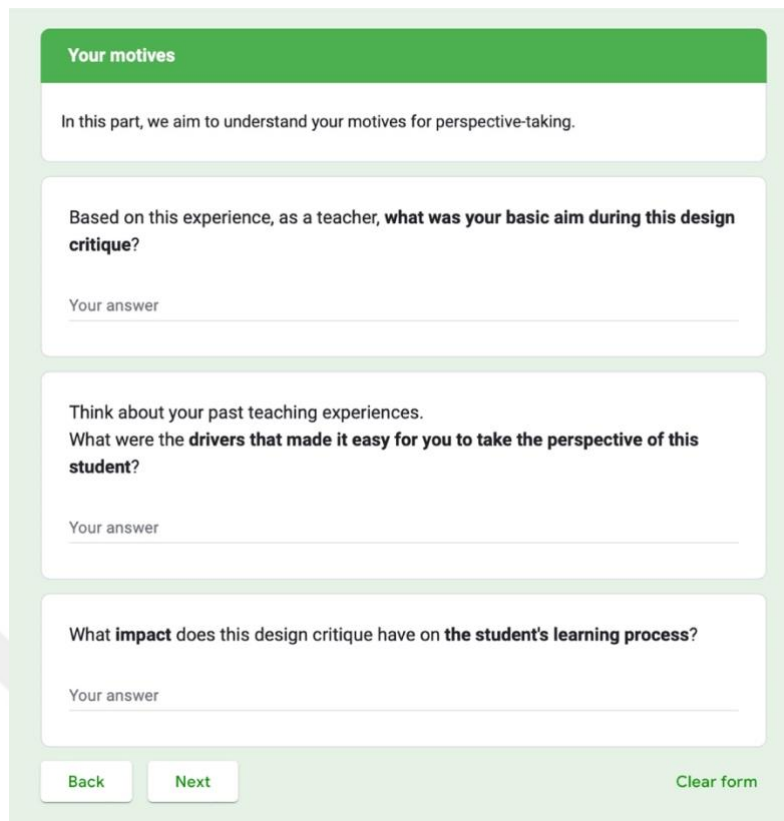
Your answer _____

Please upload your drawing here, if you have one.

[📎 Add File](#)

[Back](#) [Next](#) [Clear form](#)

Figure K.2 (continued): The form of Day 2 (Design project and your critique page).



Your motives

In this part, we aim to understand your motives for perspective-taking.

Based on this experience, as a teacher, **what was your basic aim during this design critique?**

Your answer

Think about your past teaching experiences.
What were the **drivers that made it easy for you to take the perspective of this student?**

Your answer

What **impact** does this design critique have on **the student's learning process?**

Your answer

[Back](#) [Next](#) [Clear form](#)

Figure K.3 : The form of Day 2 (Your motives page).

Reflections on your ongoing practices

In this part, we aim to understand the reflections on your ongoing practices.

Remember your ongoing and recent experiences in design courses.

Write down a practice of yours that you take the perspective of a student (you may want to record your voice instead of writing - please upload it to the next file).

Your answer

Please upload your voice record here, if you have one.

[Add File](#)

Give advice to a peer teacher on how to take the perspective of a student.

Your answer

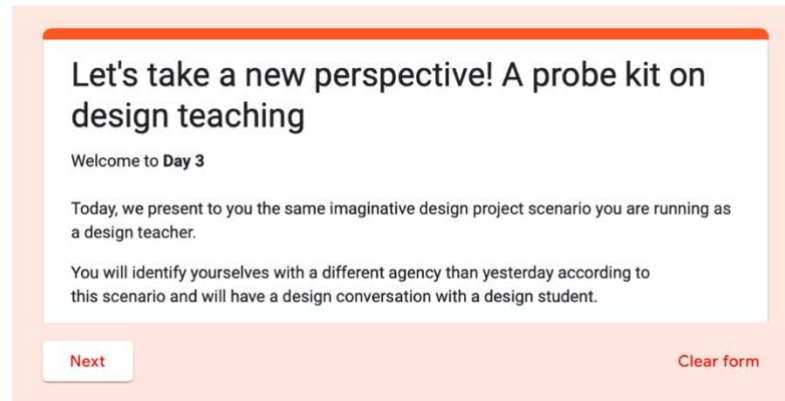
Thank you for your contribution.
See you tomorrow, Day 3 :)

[Back](#) [Submit](#) [Clear form](#)

Figure K.4 : The form of Day 2 (Reflections on your ongoing practices page).



APPENDIX L : The form of Day 3.



The image shows a digital form titled "Let's take a new perspective! A probe kit on design teaching". Below the title, it says "Welcome to Day 3". The main text of the form reads: "Today, we present to you the same imaginative design project scenario you are running as a design teacher." and "You will identify yourselves with a different agency than yesterday according to this scenario and will have a design conversation with a design student." At the bottom left of the form is a button labeled "Next", and at the bottom right is a link labeled "Clear form". The entire form is set against a light orange background.

Figure L.1 : The form of Day 3 (Welcome page).

Design project and your critiques

Please immerse yourself into this scenario, you can fill the gaps in your minds imaginatively.

Imagine that you carry out a design project in your design studio/course, which aims to design a foldable and portable pencil case for primary school age children between 7-10 that can be used at both home and school. The pencil case should contain ten 20cm length pens and two erasers (4x2x1cm dimensions).

You are in a collaboration with a company recycling plastic and producing 2mm plastic sheet materials, so it should be produced by those sheet materials particularly. In addition to this, design students can only use zippers as a connection material.

In this project, you also have a primary school stakeholder. Design students can visit the school to observe the practices of children and teachers, as well as the environment. They also conduct user research and collaborative design sessions through different methods such as conducting domestic probes or workshops, organizing surveys, interviewing with children, teachers, and parents, etc. and present you.

The outcomes of this design project will be the prototypes in minimum material use and cost. They should be produced by the company with basic form-giving techniques such as folding, cutting, twisting, etc. They should also be stacked with minimum space loss for a sustainable distribution process. The company will produce and distribute the pencil holders for the needs of children in rural areas as a social responsibility project. You also conducted this design project in your previous semesters with different student groups.

Think that you are in a design conversation with one of the design students in the course. He is in the concept development phase and shows you his research findings, sketches, and initial models. Your conversation also includes sharing the experiences and decision specific to his design process. According to his user research and practices observed, his design concept is to ease the grouping and sorting of pens according to children's needs as well as to increase the access of pens inside the backpacks or on the tables. His first idea and model are to create a 25cm length and 5cm diameter cylindrical form that enables accession from both sides of the circles by zippers. He also tries to create particular compartments for sorting the pens. He tries to solve how the pens can be picked, inserted, and organized easily by children from this small space and the immobilization of the compartments. He also has problems with the production method of this form, the use of zippers in such a short radial area and the cost of combining multi pieces of the product such as lids, body, compartments.

Therefore, he mentions his difficulties to develop his concept and form as well as to use the sheet material with all these challenges. He also mentions his unsatisfactory and problematic design project experiences that happened before.

A sketch of the student.

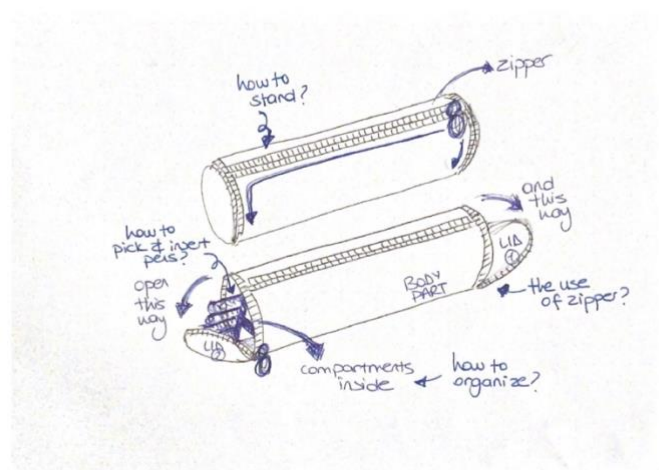


Figure L.2 : The form of Day 3 (Design project and your critiques page).



Give yourself a minute and imagine that you are a child between 7-10 ages mentally and emotionally even bodily.
Now, you would like to simulate how a child interacts with his/her model and interprets it. Think that you will give a design critique to this student from the perspective of this child user with the voice of this child user.

What would you say?
Imagine the main points of the critique and please write in detail (you may want to record your voice instead of writing - please upload it to the next file).

Your answer

Please upload your voice record here, if you have one.

[Add File](#)

How would you act?
Imagine your bodily performances and could you please describe in detail (you may draw your bodily performances if it is possible - please upload it to the next file).

Your answer

Please upload your drawing here, if you have one.

[Add File](#)

[Back](#) [Next](#) [Clear form](#)

Figure L.2 (continued): The form of Day 3 (Design project and your critiques page).

Your motives

In this part, we aim to understand your motives for perspective-taking.

Based on this experience, as a teacher, **what was your basic aim during this design critique?**

Your answer

Think about your past teaching experiences.
What were the **drivers that made it easy for you to take the perspective of this child user?**

Your answer

What **impact** does this design critique have on **the student's learning process?**

Your answer

[Back](#) [Next](#) [Clear form](#)

Figure L.3 : The form of Day 3 (Your motives page).

Reflections on your ongoing practices

In this part, we aim to understand the reflections on your ongoing practices.

Remember your ongoing and recent experiences in design courses.

Write down a practice of yours that you take the perspective of a user (you may want to record your voice instead of writing - please upload it to the next file).

Your answer

Please upload your voice record here, if you have one.

[Add File](#)

Give advice to a peer teacher on how to take the perspective of a user.

Your answer

Thank you for your contribution.
See you tomorrow, Day 4 :)

[Back](#)

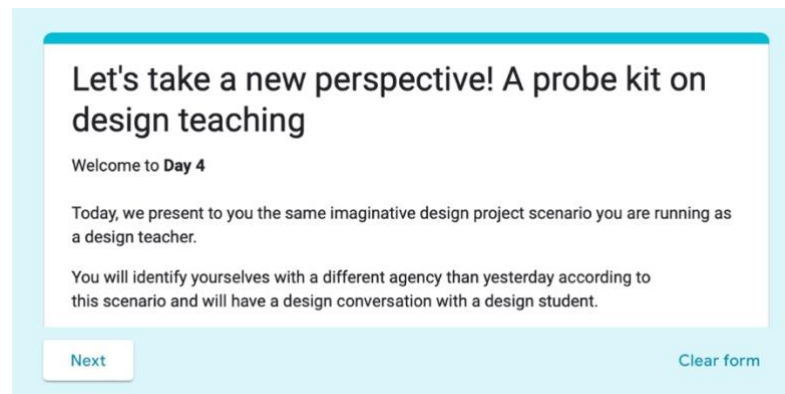
[Submit](#)

[Clear form](#)

Figure L.4 : The form of Day 3 (Reflections on your ongoing practices page).



APPENDIX M : The form of Day 4.



The image shows a digital interface for a design teaching probe kit. It features a light blue header bar. Below it, a white box contains the following text: "Let's take a new perspective! A probe kit on design teaching", "Welcome to Day 4", "Today, we present to you the same imaginative design project scenario you are running as a design teacher.", and "You will identify yourselves with a different agency than yesterday according to this scenario and will have a design conversation with a design student." At the bottom of the white box, there is a "Next" button on the left and a "Clear form" link on the right.

Figure M.1 : The form of Day 4 (Welcome page).

Design project and your critiques

Please immerse yourself into this scenario, you can fill the gaps in your minds imaginatively.

Imagine that you carry out a design project in your design studio/course, which aims to design a foldable and portable pencil case for primary school age children between 7-10 that can be used at both home and school. The pencil case should contain ten 20cm length pens and two erasers (4x2x1cm dimensions).

You are in a collaboration with a company recycling plastic and producing 2mm plastic sheet materials, so it should be produced by those sheet materials particularly. In addition to this, design students can only use zippers as a connection material.

In this project, you also have a primary school stakeholder. Design students can visit the school to observe the practices of children and teachers, as well as the environment. They also conduct user research and collaborative design sessions through different methods such as conducting domestic probes or workshops, organizing surveys, interviewing with children, teachers, and parents, etc. and present you.

The outcomes of this design project will be the prototypes in minimum material use and cost. They should be produced by the company with basic form-giving techniques such as folding, cutting, twisting, etc. They should also be stacked with minimum space loss for a sustainable distribution process. The company will produce and distribute the pencil holders for the needs of children in rural areas as a social responsibility project. You also conducted this design project in your previous semesters with different student groups.

Think that you are in a design conversation with one of the design students in the course. He is in the concept development phase and shows you his research findings, sketches, and initial models. Your conversation also includes sharing the experiences and decision specific to his design process. According to his user research and practices observed, his design concept is to ease the grouping and sorting of pens according to children's needs as well as to increase the access of pens inside the backpacks or on the tables. His first idea and model are to create a 25cm length and 5cm diameter cylindrical form that enables accession from both sides of the circles by zippers. He also tries to create particular compartments for sorting the pens. He tries to solve how the pens can be picked, inserted, and organized easily by children from this small space and the immobilization of the compartments. He also has problems with the production method of this form, the use of zippers in such a short radial area and the cost of combining multi pieces of the product such as lids, body, compartments.

Therefore, he mentions his difficulties to develop his concept and form as well as to use the sheet material with all these challenges. He also mentions his unsatisfactory and problematic design project experiences that happened before.

A sketch of the student.

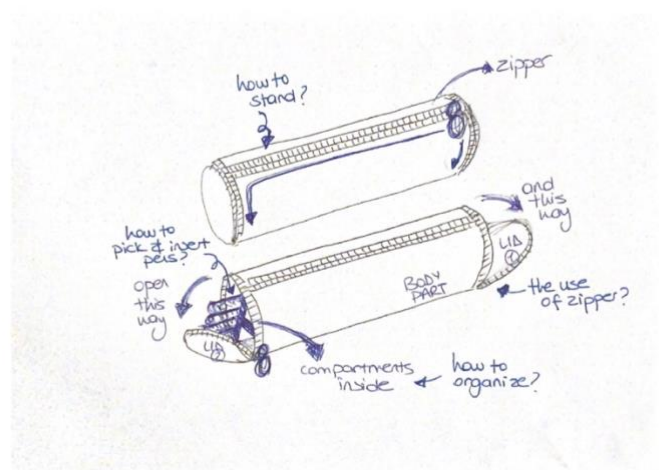


Figure M.2 : The form of Day 4 (Design project and your critiques page).

Give yourself a minute and imagine that you are the physical model or mock-up mentally and emotionally even bodily.
Now, you would like to simulate the behavior and properties of the material to the student. Think that you will give a design critique to this student from the perspective of this model with the voice of this model.

What would you say?
Imagine the main points of the critique and please write in detail (you may want to record your voice instead of writing - please upload it to the next file).

Your answer

Please upload your voice record here, if you have one.

[Add File](#)

How would you act?
Imagine your bodily performances and could you please describe in detail (you may draw your bodily performances if it is possible - please upload it to the next file).

Your answer

Please upload your drawing here, if you have one.

[Add File](#)

[Back](#) [Next](#) [Clear form](#)

Figure M.2 (continued): The form of Day 4 (Design project and your critiques page).

Your motives

In this part, we aim to understand your motives for perspective-taking.

Based on this experience, as a teacher, **what was your basic aim during this design critique?**

Your answer

Think about your past teaching experiences.
What were the drivers that made it easy for you to take the perspective of this model/ material?

Your answer

What impact does this design critique have on the student's learning process?

Your answer

[Back](#) [Next](#) [Clear form](#)

Figure M.3 : The form of Day 4 (Your motives page).

Reflections on your ongoing practices

In this part, we aim to understand the reflections on your ongoing practices.

Remember your ongoing and recent experiences in design courses.

Write down a practice of yours that you take the perspective of a model/material (you may want to record your voice instead of writing - please upload it to the next file).

Your answer

Please upload your voice record here, if you have one.

[Add File](#)

Give advice to a peer teacher on how to take the perspective of a model/material.

Your answer

Thank you for your contribution.
See you tomorrow, last day :)

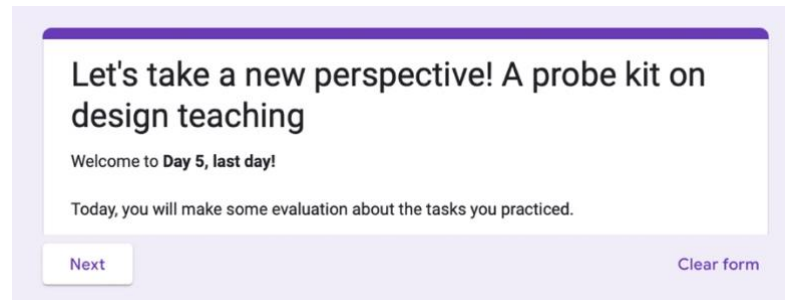
[Back](#)[Submit](#)

[Clear form](#)

Figure M.4 : The form of Day 4 (Reflections on your ongoing practices page).



APPENDIX N : The form of Day 5.

A screenshot of a web form titled "Let's take a new perspective! A probe kit on design teaching". The form has a light purple border and a white background. It contains the following text: "Welcome to Day 5, last day!" and "Today, you will make some evaluation about the tasks you practiced." At the bottom left, there is a button labeled "Next". At the bottom right, there is a link labeled "Clear form".

Let's take a new perspective! A probe kit on design teaching

Welcome to Day 5, last day!

Today, you will make some evaluation about the tasks you practiced.

Next

Clear form

Figure N.1 : The form of Day 5 (Welcome page).

Evaluation

Remember the tasks you practiced up till today. You took the perspective of a design student, a child user, a model/ material.

Based on your experience, please rank these perspective-taking practices from easiest to hardest for you.

	1 (easiest)	2	3	4	5 (hardest)
Taking the perspective of a student	☐	☐	☐	☐	☐
Taking the perspective of a user	☐	☐	☐	☐	☐
Taking the perspective of a model/ material	☐	☐	☐	☐	☐

Could you explain why?

Your answer

Based on your own teaching experiences, please rank these perspective-taking practices from the least frequently used to the most frequently used by you.

	1 (least frequent)	2	3	4	5 (most frequent)
Taking the perspective of a student	☐	☐	☐	☐	☐
Taking the perspective of a user	☐	☐	☐	☐	☐
Taking the perspective of a model/ material	☐	☐	☐	☐	☐

Could you explain why?

Your answer

Figure N.2 : The form of Day 5 (Evaluation page).

Based on your own teaching experiences, please **rank these practices from most important to least important** according to their impact on the student's learning process.

	1 (least important)	2	3	4	5 (most important)
Taking the perspective of a student	☐	☐	☐	☐	☐
Taking the perspective of a user	☐	☐	☐	☐	☐
Taking the perspective of a model/ material	☐	☐	☐	☐	☐

Could you explain why?

Your answer _____

Based on your own teaching experiences, please **rank these practices from least helpful to most helpful to enable an empathic understanding with design students**.

	1 (least helpful)	2	3	4	5 (most helpful)
Taking the perspective of a student	☐	☐	☐	☐	☐
Taking the perspective of a user	☐	☐	☐	☐	☐
Taking the perspective of a model/ material	☐	☐	☐	☐	☐

Could you explain why?

Your answer _____

Figure N.2 (continued): The form of Day 5 (Evaluation page).

Could you explain why?

Your answer

What was the **most interesting thing** for you during this study?

Your answer

Do you have any **evaluation, thought or suggestion** for this study?

Your answer

The study has been completed.
Thank you for your valuable contribution.

[Back](#) [Submit](#) [Clear form](#)

Figure N.2 (continued): The form of Day 5 (Evaluation page).

APPENDIX P : Participant list.**Table P.1 : Participant list.**

Participants	Country	Title	Department	Teaching experience
Participant 1	Türkiye	Assistant professor	Industrial design	10 and more
Participant 2	Türkiye	Assistant professor	Industrial design	10 and more
Participant 3	Finland	Postdoctoral researcher	Design	10 and more
Participant 4	Türkiye	Research assistant	Industrial design	1-3 years
Participant 5	Türkiye	Assistant professor	Industrial design	6-9 years
Participant 6	China	Visiting lecturer, Assistant professor	Visual communication design, Industrial design	10 and more
Participant 7	Finland	Lecturer	Design	10 and more
Participant 8	Portugal	Assistant professor	Design	10 and more
Participant 9	Finland	Associate professor	Art and media	10 and more
Participant 10	UK	Postgraduate researcher	Interior architecture	1-3 years
Participant 11	Finland, China	Visiting researcher	Design	1-3 years
Participant 12	Finland	Lecturer	Design	6-9 years
Participant 13	Finland	Assistant professor	Applied design	4-6 years
Participant 14	Finland	Doctoral researcher	Design	1-3 years
Participant 15	Finland	Doctoral researcher	Art and media	4-6 years



APPENDIX R : Coding agenda used in the data analysis.

Table R.1 : Coding agenda used in the data analysis.

Categories	Sub-categories
Conceptualisation of empathy	Perceived empathy
	Empathy in design studio
	Empathic design conversation
Perspective-taking in design conversations	Taking the perspective of design students
	Taking the perspective of users
	Taking the perspective of materials
The motives around perspective-taking	The intentions behind perspective-taking
	<i>The intentions behind perspective-taking of design students</i>
	<i>The intentions behind perspective-taking of users</i>
	<i>The intentions behind perspective-taking of materials</i>
	<i>The personal motivations behind perspective-taking of design students</i>
	<i>The personal motivations behind perspective-taking of users</i>
	<i>The personal motivations behind perspective-taking of materials</i>
	<i>The potential impacts of perspective-taking of design students</i>
	<i>The potential impacts of perspective-taking of users</i>
	<i>The potential impacts of perspective-taking of materials</i>



CURRICULUM VITAE

Name Surname : Pelin EFİLTİ

EDUCATION

- **B.Sc.:** 2015, Istanbul Technical University, Faculty of Architecture, Department of Industrial Product Design
- **M.Sc.:** 2019, Istanbul Technical University, Faculty of Architecture, Department of Industrial Design

PROFESSIONAL EXPERIENCE AND REWARDS

- 2015 Mar -2016 Mar: Orhan Irmak Tasarım A.Ş., *Industrial Designer*
- 2016 Mar - 2018 Feb: Istanbul Medipol University, Department of Industrial Product Design, *Research Assistant*
- 2022 Jan - 2022 June: Aalto University, *Visiting Researcher*
- 2023 July - 2024 Jan: Aalto University, *Visiting Researcher*
- 2018 Mar - present: Istanbul Technical University, Department of Industrial Design, *Research Assistant*

PUBLICATIONS ON THE THESIS

- **Efiliti, P.,** Gelmez, K. 2023. Mapping three dimensions of empathy in design education: Educational interventions, aspects and contexts, *Art, Design & Communication in Higher Education*, 22(1), 121-148.
- **Efiliti, P.,** Gelmez, K. 2024. A deep dive into the impacts of empathy on design learning and teaching, *International Journal of Technology and Design Education*, 34(2), 809–852.
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- **Efiliti, P.** Gelmez, K. in review. Let's take a new perspective!: A pedagogical probe study for digging into the empathic perspective-taking of design teachers, *ANONYMOUS*.

OTHER PUBLICATIONS AND AWARDS

Journal Articles

- **Efiliti, P.** 2022. Mobile diaries method as a data collection tool: Delving into menstrual experiences of women in the public space, *Journal of Design Research*, 20(1), 35-57
- **Efiliti, P.**, Gelmez, K. 2022. A closer look into pedagogical roles of supporting staff in design studio courses: The case of research assistants in Turkey, *International Journal of Technology and Design Education*, 33(3), 1143–1172.
- **Efiliti, P.**, Merzali Celikoglu, O. 2022. “The food package makes my hands dirty now”: Exploring Turkish ways of cleaning during the pandemic, *Home Cultures*, 19(1), 49-72.
- Gelmez, K., **Efiliti, P.**, Yılmaz, O. 2022. “Well, a tough question. Congratulations”: How and in what aspects do design students evaluate a design studio course?, *International Journal of Technology and Design Education*, 33(4), 1585-1606.
- **Efiliti, P.**, Gelmez, K. 2021. Celebrating the variety, fighting the confusion: An integrative review of the design teacher's pedagogical roles, *Art, Design & Communication in Higher Education*, 20(2), 243-287.
- Soylu, Y., Karaca Şalgamcıoğlu, B., **Efiliti, P.**, Kasajima, O. 2017. The anatomy of a multi-sensory design course: Happy sound object, *The Design Journal*, 20 (sup1), S1367-S1379.

Conference Proceedings

- **Efiliti, P.**, Gelmez, K., Tatlısu, E., Tüfek, T. E., Yılmaz, O. 2022. Investigating the means utilized by the supporting staff in design studio courses: An interview study, *Research & Education in Design Conference (REDES) 2022*, 19 Mayıs.
- Gelmez, K., **Efiliti, P.**, Tatlısu, E., Tüfek, T., Yılmaz, O. 2021. Framing research assistants' pedagogical roles in design studio courses: Initial findings. *DRS LearnxDesign 2021: 6th International Conference for Design Education Researchers*, 4, 934-947.
- Tüfek Şerifoğlu, T., **Efiliti, P.** 2021. Tasarım öğrencisinin öğrenme süreçlerinde sosyal medya etkisi: Bir araştırma ve sergileme aracı olarak Instagram, *4. Ulusal Tasarım Araştırmaları Konferansı - Tasarım ve Öngörü*, 8-10 Eylül, 2020, Ankara.
- **Efiliti P.**, Çelebi, G. 2020. Re-defining domestic craft-Making: Cultivation of new craft practices and identity through the social media, *Proceedings of Pivot 2020: Designing a world of many centers Virtual conference*, New Orleans, June 4, 2020 (held online).
- **Efiliti, P.**, Gürtunca, Ö., Bağlı, H. H., Soyupak, O. 2018. The use of design thinking in a multidisciplinary context: Collaborating with a start-up project, *To Get There: Designing Together Cumulus Conference Proceeding*, 11-13 April 2018, Paris, France.

Awards

- **Publication Award:** ITU 2023 Publication Award (April 2024)
- **Research Award:** The Scientific and Technological Research Council of Türkiye (TÜBİTAK) - 2214-A International Research Fellowship (February 2023)
- **Research Award:** Tinçel Cultural Foundation - International Research Fellowship (February 2023)



