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Materials designers and the translational approach: a case from a product design company

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Abstract: Design professionals are inherently translators due to the multi-faceted nature of the design process that often encompasses considerations of technologies, manufacturing, materials, etc. In investigating the emerging practice of 'materials designers', it has been found that they must develop strong 'translational design skills' to address a material-driven design process when collaborations with diverse stakeholders exist. Especially to create new materials and products or to obtain exclusive material features and experiences. Through a real-life case study on developing a circularity-oriented material from waste, this paper articulates translational design practice in materials design, highlighting its relevance in the design process. The study was unfolded through observations and participation in a product design company and by interviewing the design manager within the project. Based on the results, translational design skills in materials design practice are emphasized, and translational design recommendations are proposed for accelerating the successful materials design process in complex collaborations.

Keywords: materials design, design firms, professional practice, material-driven design

1. Introduction

Design professionals are often recognized as translators. They have been identified in production, translating technologies into impactful applications, and communication concerning mediation, transference, and transcription (Baule & Caratti, 2016a; Page & John, 2019). The designers' ability to make knowledge accessible through facilitation, articulation, and communication has been highlighted on different occasions (Baule & Caratti, 2016b; Hornbuckle, 2022). 'Designers as translators' tend to demonstrate their capacity to act in complex scenarios, integrating needs, cultural values, and possible solutions into concrete outcomes. Lately, the concept of translation has become more recognized in design and codified by some authors. However, it remains intricate, with great potential yet to be explored (Bucchetti et al., 2023).

The translational design emerged from 'translational research', a process that can turn ideas and knowledge into practical applications (Drolet & Lorenzi, 2011). Studies integrating translational research and design concepts in various fields have pointed to the close relationship between both practices. Indeed, some authors have argued that those share complexities and ambiguities, revealing the difficulties of operating with incomplete information and the link both have in creative processes (Baule & Caratti, 2016b; Page & John, 2019).

Despite the research, 'translation' remains undefined in the design field. Indeed, this work attempts to address this gap by contributing to defining the translational practice. The paper develops to articulate this term within the emerging field of material design (Clèries et al., 2021a; Rognoli & Levi, 2005) in product design companies. Through a case study focusing on one material from waste (Duarte Poblete et al., 2024), i.e., a circularity-oriented material for low environmental impact design, the 'translational' scenarios and dynamics that emerged to support the development process are explored. As a result, translational design is defined as an essential skill and practice that materials designers can use to manage material-driven design (MDD) projects where multiple disciplines and stakeholders exist. Finally, the authors propose translational design recommendations for a successful materials design process in complex collaborations.

This paper originates from doctoral research focusing on the emerging role of 'materials designers' (Clèries & Rognoli, 2021; Dal Palù, 2020) and materials design, a growing field within industrial design (Rognoli & Levi, 2005). This area is evolving and featuring materials designers as versatile transdisciplinary specialists (Pedgley et al., 2021) with the increasing intention to frame materials and processes within design for environmental sustainability, fostering their life cycle design and the low environmental impact (Vezzoli, 2018).

Materials designers are recognized for their interest in the material dimension and the possibility of bringing a holistic and sensible view of materials to the product design process (Rognoli & Ayala-Garcia, 2021). In short, they navigate the intricate landscape of materials, technologies, environmental sustainability, and end-user experiences. When they are included in environments with diverse professionals and partners, such as companies or complex projects, their ability to operate with translation skills appears crucial.

The remainder of the paper elaborates as follows: section 2 briefly illustrates the understanding of materials designers. Section 3 unfolds related work on design, materials, and the concept of translation. Section 4 describes the methodological approach. Section 5 explores the case study and its context, while section 6 presents the results and discussion. To finalize, conclusions and final remarks are summarized.

2. Materials designers: an emerging profession

Materials designers are increasingly identified practitioners with an interdisciplinary approach that converges knowledge and practices from different fields like biology, alchemy, gastronomy, and material science (Ayala Garcia & Rognoli, 2018; Dal Palù, 2020). While their role is often recognized in academic settings, interdisciplinary labs, and design studios or

start-ups (Clèries et al., 2021), their contribution to companies and complex projects is still unclear or less recognized.

Drawing on different authors' work, materials designers are practitioners who operate at the intersection of design and materials, often conceiving a MDD approach (Karana et al., 2015), i.e., exploring and creating materials from the beginning of the design process, for a product design or concept and its related experiences (Karana et al., 2014; Karana et al., 2015; Pedgley et al., 2021). Materials designers deeply study, explore, and create materials from the ideation phase, interpreting matter as the basis of all physical projects, sometimes indicating that the material is the project itself (Rognoli & Levi, 2005). These designers are lately prioritizing material life cycles, gathering detailed information on raw materials and their impacts, considering the stakeholders in the production, and looking for end users' acceptance and adoption, progressively focusing on ecological and social aspects (Bak-Andersen, 2021). Clèries et al. (2021) describe that materials designers guide the design procedure by managing material properties, exploring potential material modifications, and considering materials' experiential, functional, and aesthetic aspects, often using hands-on experimentation. They are also experts in forecasting and material research, where they undertake scientific investigations to acquire transdisciplinary expertise, linking materials to science, technology, circular economy, and other fields (Duarte Poblete et al., 2023).

The skillset of materials designers encompasses activities such as the discovery and re-evaluation of matter and materials, identification of new resources, creation of material samples and prototypes, refinement of material characteristics and properties, materials storytelling, and final product applications (Vélez et al., 2022). Materials designers have been defined as materials specialists, circular materials designers, and DIY-Materials designers (Clèries & Rognoli, 2021), thus illustrating a field that still requires integration to achieve recognition as a widely accepted profession.

3. Related work: design, materials, and translation

While translational research is primarily associated with medical studies (van der Laan & Boenink, 2015), its presence in the design field is increasing. Translation in design is progressively recognized for its role in achieving tangible results, especially when navigating challenges between diverse research and innovation cultures. This evolving concept of translation in design is characterized by boundary-spanning, facilitating collaboration across various contexts of industry and research (Hornbuckle, 2022; Page & John, 2019).

Regarding design and materials research, the concept of 'translation' has been conceptualized by several authors (Hornbuckle, 2010, 2018, 2020, 2022; Morgan, 2011; Ribul et al., 2021; Ribul & De La Motte, 2018; Wilkes et al., 2016; Wilkes & Miodownik, 2018). These contributions informed and inspired the current work.

Morgan (2011) reflects on the practical translation from materials to the design process. He suggested that when studying materials, they communicate and can impact material choices while providing designers with a clear vision of the product idea. In this process, designers

discover the essential material expression of a particular product and develop a more robust and reliable problem-solving process.

Hornbuckle brought the concept of translation on different occasions. In her doctoral investigation (Hornbuckle, 2013), she exposed that 'material librarians' played a dynamic role as translators and disseminators of material information. Hence, designers gain a deeper understanding of materials through a dialogue guided by a material librarian who translates data supported by the materials library system. In other work, Hornbuckle (2018) addressed communication barriers in interdisciplinary collaborations, especially design-driven material innovation projects (Tubito et al., 2019). She proposed 'materials liaison officers' as bilingual translators of materials concepts between designers and materials scientists. In addition, in similar work, she articulated the concept of translation within materials samples as 'boundary objects' to translate scientific data into experiential language for designers. This work highlights materials' potential and complex functions in collaborative material development projects (Hornbuckle, 2018). In more recent work, Hornbuckle (2022) situates translational design as a broader practice that can address the challenges of complex collaborations and support innovation, showing some examples from materials development.

In the work of Wilkes et al. (2016) and Wilkes and Miodownik (2018), the authors articulate the concept of translation in materials and design to foster interdisciplinary collaboration. The former work focuses on using isomorphic material stimuli to bridge the gap between designers and materials scientists through sensory experiments. The latter highlights the role of material libraries in translation, emphasizing their dynamic nature and ability to provoke dialogue and inspire new research. Both articles advocate a multidisciplinary approach that enriches the transition of materials from the laboratory to society.

Ribul et al. (2021) and Ribul and De La Motte (2018) elaborated on the concept of translation to illustrate the communication procedures through material experimentation in collaborative projects. They highlighted its significance in fostering cross-disciplinary dialogue between technical scientists and textile designers.

From these studies, the role of translation within materials and design appears to be a process of transmitting the essence of the materials to the designers and an understanding of what the materials are intended to communicate in general through design. Another insight points to translation as a means of converting information about materials to facilitate communication between disciplines and professionals. These translational concepts have been recognized as transforming material knowledge into tangible real-world applications.

In summary, translation practice within materials and design has been seen as a valuable approach to overcoming barriers in interdisciplinary collaborations. However, the literature did not formally define translational practice in materials design.

4. Methodological approach

4.1 Methodology and methods

This work embraces qualitative case study research. A case study (Yin, 2009) is an empirical investigation exploring a phenomenon within its real-life setting. Data collection methods facilitated a thorough examination to unfold the case study.

The case study is called "Fiber 12" and has been developed as a material design project by Caimi Brevetti. Between February and July 2023, the case was studied inside the design company. The data has been explored and collected through qualitative approaches using participant observation and through practice in the field. Participatory observation (Guest et al., 2017) is a research method where the researcher immerses themself in the company's environment to observe the participants' behaviors, interactions, and practices. It fosters learning through daily dialogue with the company's employees and allows conversational interviewing (Leverentz, 2021). Research through practice in the field (Koskinen et al., 2011) involves studying design in its natural context within real-world settings. Both approaches allow data collection through notetaking and reports. Finally, a semi-structured interview with the project manager head of the design team, was used to uncover unseen details of the case study process and the designerly attitude they employed to face the material design project. As Adams (2015) described, the interview allows for an in-depth exploration of professional experiences, opinions, and knowledge. The collected data was used to create the case study narrative in Section 5.

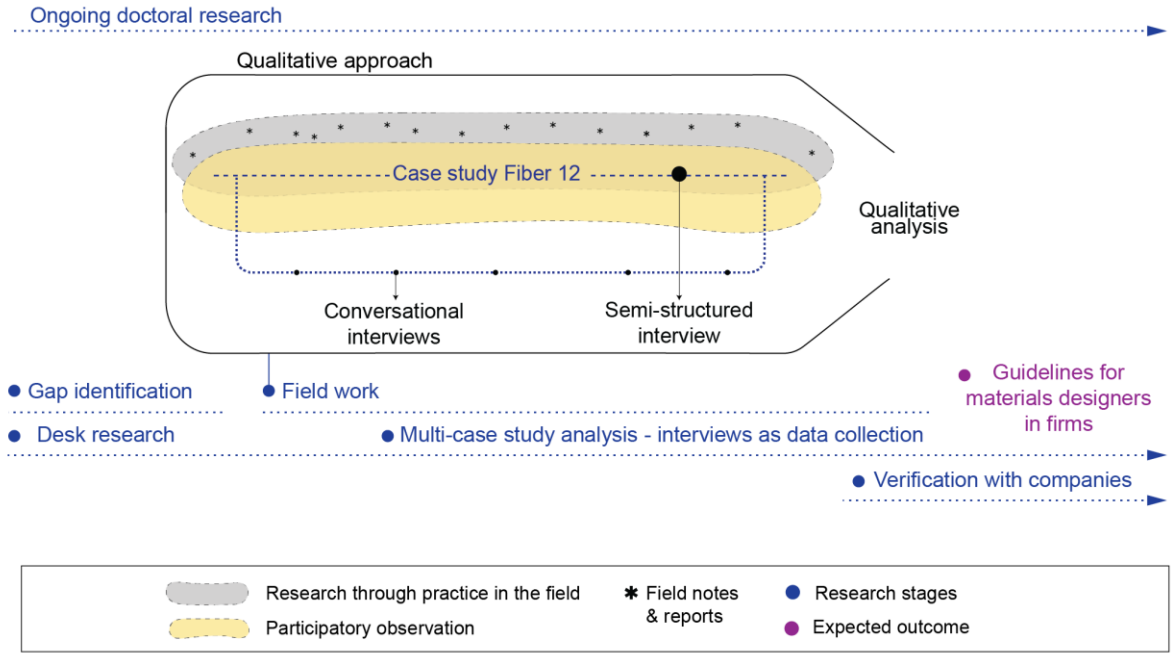

Figure 1 Summary of the data collection methods within the case study, integrated with an overview of the research stages and one direct expected outcome.

4.2 Rationale

The case study was selected because it is an innovative project born from a collaboration between partners and professionals from diverse disciplines. It highlights a challenge for translational design practice and materials designers in a complex partnership. Furthermore, this case is of interest in the current context because the expected outcome aims to drive design with low environmental impact, also a complex objective. Lastly, this project was considered appropriate, given its straightforward MDD approach. As explained above, MDD fosters designing products and materials inspired by material exploration, experimentation, and multidisciplinary research (Bak-Andersen, 2021; Karana et al., 2015; van Bezooyen, 2014).

Furthermore, selecting this case study has a notable advantage. It was an advanced project when the research started, and the invention was patented, so analyzing and sharing its details was viable.

4.3 Data analysis

Data analysis took place in an iterative process during the participatory observation, which allowed for repeated returns to earlier stages of investigation as evidence was assembled and ideas were consolidated (Dey, 2003). Given the exploratory nature of this study, an inductive approach, starting with observations and identifying themes to formulate a general theory and hypothesis, was considered appropriate (Azungah, 2018). Organizing fieldwork notes in Miro boards and short reports helped extract meaningful insights, patterns, and knowledge from the material design process and the translational scenarios. The coding of the data by themes and stages of the process was essential to recreate and examine the case study in detail to understand the dynamics and actors involved. Early insights were used to create the semi-structured interview for the project manager. The interview was used to uncover unseen details. It was performed by the end of the participatory observation, to sum up and drive to a proper assemblage of information verified by the manager. All the data collected was used to report the case study and search for the logic of materials designers' activities.

Diagrams from the analysis were created to illustrate and understand the case better. Authors craft these visuals and should be viewed from an external perspective of the organization. Those diagrams are research tools for theory development and self-reflection; they are interpretations, not specific representations of company processes.

5. Case study

5.1 Case context

Fiber 12 originates within the dynamic landscape of Caimi Brevetti. It is a leading European design-driven company recognized for furniture and furnishings design across diverse sectors, including the home, office, and contract domains. Caimi Brevetti drives scientific and technological research into acoustic comfort, where it pioneered sound-absorbing materials

and solutions under the 'Snowsound' technology. This company has an exciting research environment in which materials design and exploration play an important role. However, there are no internal experts dedicated to materials design. The company counts on science labs set to conduct theoretical and applied research regarding technology, acoustics, new materials, and prototypes. These labs are recognized as 'Caimi Open Labs' and are well-equipped to foster interdisciplinary investigations.

5.2 Fiber 12

Fiber 12 is an acoustic fabric that uses a yarn manufactured by regenerated nylon waste (e.g., fishing nets or used carpets). The nylon regenerated is characterized by a chemical recycling procedure of disassembling textiles and returning them to their essential chemical components, resulting in an equal raw material (Schumacher & Forster, 2022). Fiber 12 was designed and produced with this yarn to have high strength and efficient acoustic characteristics and to favor the circularity of waste by transforming it into new materials for the circular economy, reducing the environmental impact of materials extraction and end-of-life of products. The principal aim of Caimi Brevetti was to develop a 100% recycled, recyclable, and efficient acoustic fabric for product design, which can be integrated into a circular business model where waste material can be reused. Designing a product with Fiber 12 reduces reverberation and improves the acoustics of the space where it is placed.

Three companies from different areas partnered to develop Fiber 12. The partnership started in 2021 between Caimi Brevetti (the design expertise), a textile manufacturing company, and a raw material provider (nylon regenerated yarn). This study is based on the work of the design company.

The leading team managing, designing, and developing the material was formed by the head of the technical design department, who is very experienced in the field, and one designer-architect practitioner with some years of experience in the company.

The collaboration among partners started with meetings to familiarize one another with their respective productions, technologies, workforce, and areas of expertise. Following this, the experimental journey in material design began, employing a 'learning by doing' approach as described by Reese (2011).

The first step consisted of finding and selecting already produced materials with the regenerated nylon and making tests to understand general characteristics and acoustics properties. Collaboration between designers and technical experts was essential to comprehend the fabric's requirements. Caimi Brevetti's MICROMAX LAB was used during the project (Figure 2).

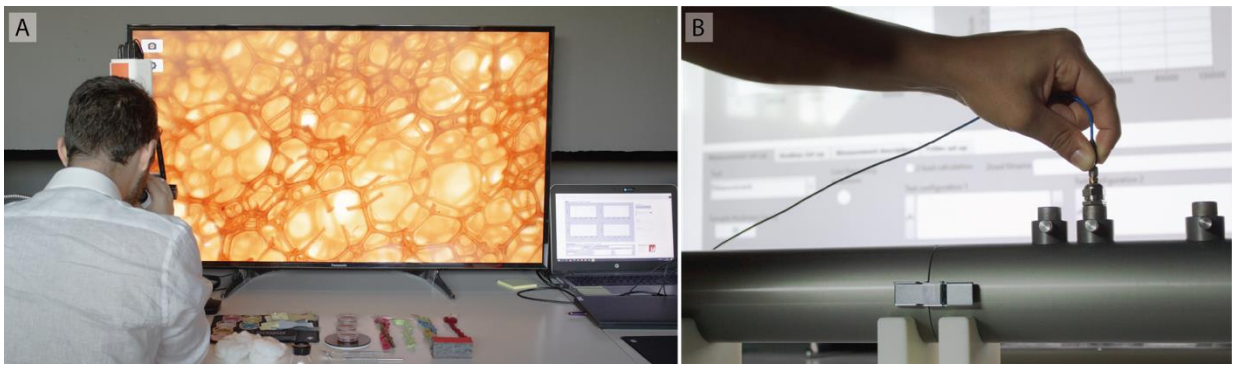

Figure 2 MICROMAX LAB. Instruments for the scientific measurement of materials. (a) high-precision microscopes for studying the microstructures; (b) Kundt impedance tubes and specialized software.

Once the best samples were chosen, the exploration was divided into two parallel paths. The first was related to the scientific investigation of the material and the possible technical-mechanical characteristics, and the second was to identify the chromatic, aesthetic, and sensorial possibilities. In both cases, materials designers collaborated with internal and external team members through meetings and interdisciplinary sessions, fostering a collaborative environment for idea exchange and proposal development. This approach enabled refining targeting criteria, optimizing manufacturing techniques, and integrating diverse opinions.

During the first path, the material design team collaborated with experts in material acoustics to define requirements. This collaboration aimed to assist in exploring and developing technical properties, such as determining fiber dimensions, thickness, density, and weave structure, among other factors. When these specifications were well-established and understood from mathematical and statistical perspectives, the material design team converted these needs into manufacturing requirements for the producers.

During the second path, the materials designers cooperated with the internal team of architects, designers, and textile experts. They discussed the possibilities of fabrics' appearance, identifying trends and opportunities. The materials designers transformed this information related to the look and experience of textiles into specific data on colors and sensory qualities for the producers. After that, manufacturers gave color to the yarns and produced fabric weave samplers to show the effects of weave and structure (Mathur et al., 2011).

Figure 3 Yarns and Samplers. (a) yarn colors and combinations; (b) fabric weave samplers.

Material tests were conducted to define the final materials, giving them the desired characteristics relevant to their potential applications in product design. Material drop, elasticity, stiffness, and other defined factors were communicated to the producers, who afterward executed the necessary processes to achieve the desired results. Once optimized, the fabrics were taken for internal and external quality examinations (Table 1).

Table 1 Quality internal and external tests.

Test	**At Caimi Brevetti Open Labs**	**External labs**
Fabric width and thickness test	X	
Microstructural features	X	
Sound absorption and transmission loss (Kundt-testing)	X	
Reverberation test (time that takes a sound level to decay)	X	
Light testing (Fading resistance, color degradation)		X
Toxic emissions		X
Pilling test (abrasion resistance)		X
Martindale (abrasion resistance)		X
Fire resistant tests		X

The developed fabrics were applied in product design, certified, and launched to the market in 2023 by Caimi Brevetti. Market studies have been recently conducted. However, determining how users will perceive and accept this material and products remains to be seen. Also, it is essential to understand if the business model in its circular form will succeed.

6. Results and discussion

6.1 General findings

Given the collaboration between companies, the interdisciplinary practitioners' input, the challenging technology, and the desired applications, we defined this case study as a complex project.

The case study narration results from the documentation of the participatory observation, the research in the field, and the interview with the design manager. The unfolded MDD process underscores the materials designer's central role. This narration also highlighted the translation challenges within the project's interdisciplinary professionals, stakeholders' systems, and the numerous interactions needed to design a new material. Two perceived translation scenarios and multiple streams of interactions during the project are summarized and illustrated in Figure 4.

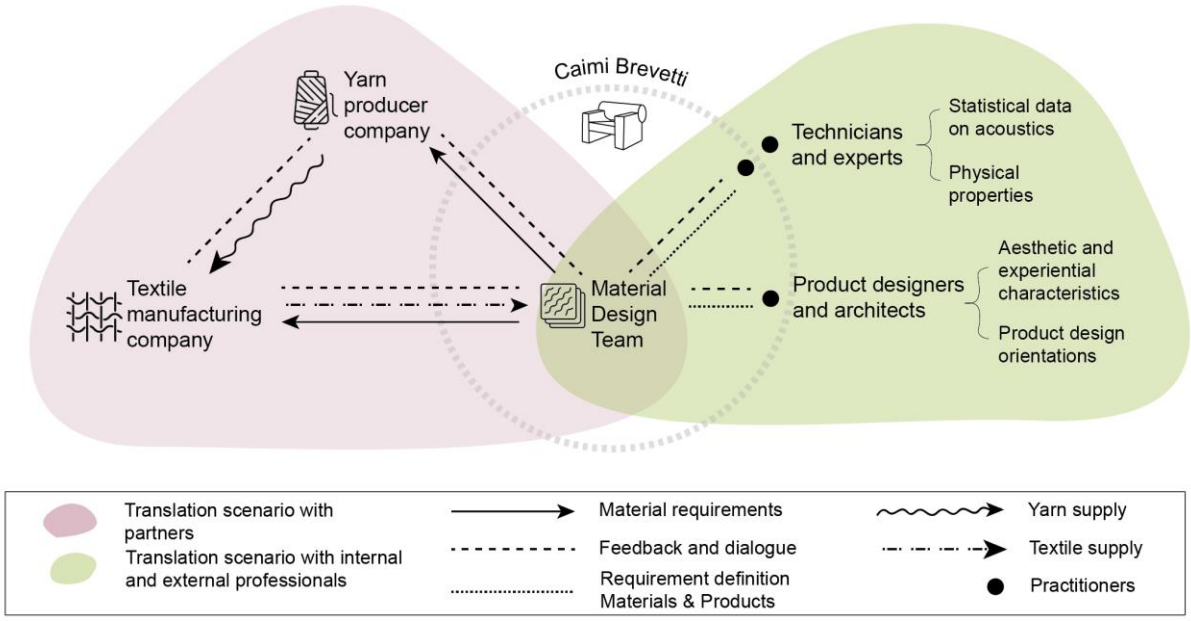

Figure 4 Perceived translation scenarios and interaction streams.

The dialogue between the material design team and the external partners characterizes the first translation scenario. The first move was to set what they were looking for, the possibilities, the raw materials, the current materials' life cycle, the elaboration processes, etc. As the designers and managers of Caimi Brevetti specialize in acoustic textile materials, they are quite experts in this field from the design point of view; thus, communication with the manufacturer partners was viable. However, there was a noticeable gap in language and work methods, which became evident due to the distinct nature of the companies. Indeed, as expressed by the manager during the interview, the best way to ask and communicate the specific processes, properties, and qualities around the material was by personally meeting the headquarters to understand machinery and techniques, where manufacturing methods and material samples were introduced. In this case, as stated by Wilkes et al. (2016), samples of textiles and yarns were seen as a tool that facilitated dialogue between the designers and the manufacturers.

Following the initial meetings, ongoing interaction primarily occurred between the textile manufacturer and the material design team, with limited involvement from yarn developers, who solely supplied the defined yarns for textile production. In the ongoing interaction, the

materials designers communicated feedback and new requirements from the design perspective using their translational skills to give input for textile manufacturing. This passage allowed for continuous process monitoring, enabling a quick evaluation of the designers' requests or the rapid identification of alternative strategies with the producers.

The second scenario in which the translation practice came to the fore was with the internal practitioners and some external collaborators with specific competencies. The materials designers had to communicate and give indications, translating to the technicians, experts, and product designers about the possible material to develop. Since the company had never used regenerated nylon textile as an acoustic material, this was a challenge with new languages and codes to interpret and transfer. This scenario is divided.

On the one hand, this scenario is characterized by the collaboration of the material design team with the technicians and experts. During encounters, the materials design team transformed information from partners into practical knowledge to obtain the proper acoustic and physical requirements. The practitioners studied the properties together and tested different samples to learn their characteristics and set some technical-mechanical requirements. Once materials designers and technicians defined the requirements, those were translated into manufacturing information for the partners. This translation accelerated the interpretation of manufactures and lessened the possibility of misunderstandings.

On the other hand, the requirements defined between materials designers and technicians were simplified for the design team, which does not always need statistical and complex data at the ideation stage. The material information was translated into input for the internal product designers and architects to discuss trends, aesthetics, and experiences. In this case, all addressed the material features, envisioning textures, colors, weaves, possible production techniques, and applications later defined and interpreted by the material design team. Again, this information was transformed and transferred to be discussed with the partners for further material development. In both cases, the materials designers were involved in interpreting and translating the requirements and decision-making, supported by experts. This intervention accelerated the material design process and reduced time and error in the results.

One interesting finding during the interview and observations was a possible third scenario of translational design practice. Once the material was designed and foreseen in an application, it had to be transmitted to the product manufacturers, communicating the new features. Additionally, the new material information must be relayed to the marketing and communication departments, external communication teams, and sales agents for cohesive storytelling. Translating the final product with the new material in clear information for all the stakeholders and final users is always essential. In this case, the product design department employed translational skills to describe it to the product manufacturers, communication, and sales.

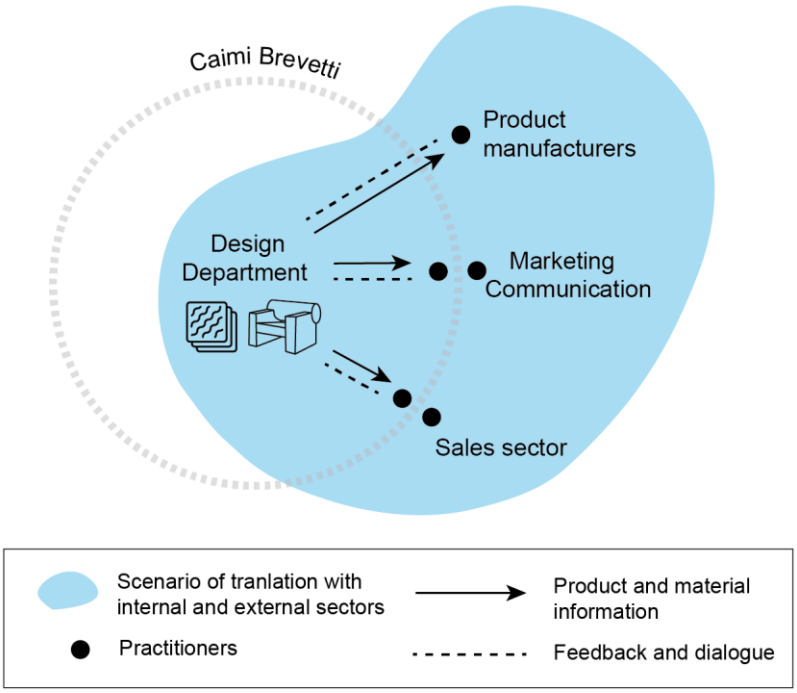

Figure 5 Perceived scenario and translational practice employed for the Design department.

The findings indicate that the process was characterized by iteration, a typical move when developing design and looking for innovation. This fact resonates with studies on translational research, where the translational paths are also considered iterative (Page & John, 2019).

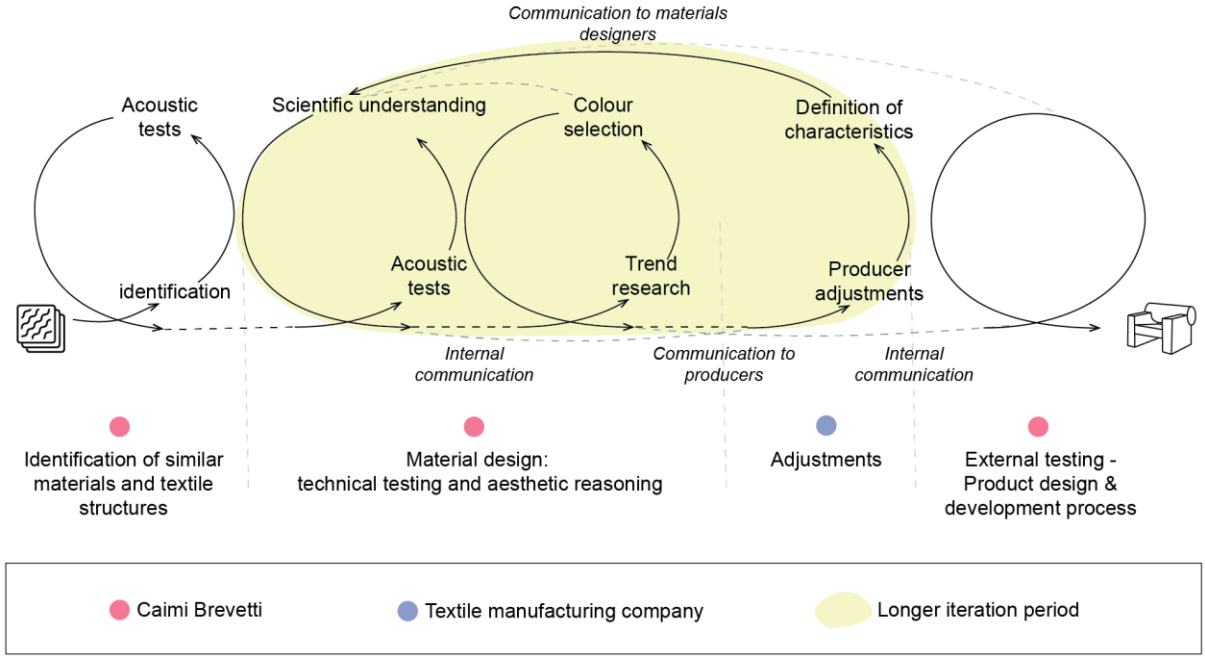

Figure 6 Iterations overview in the materials design process and the actors involved.

6.2 Materials designers and the translational practice

Material design is an emerging practice with fundamental knowledge of materials, design, and its applications. In this case, it is interpreted that materials designers are practitioners with enhanced knowledge of materials, materials sensitivity and application, and a deep understanding of materials and manufacturing processes. Furthermore, through the MDD approach, with a clear objective, as in the presented case, these professionals can guide, communicate, and interpret complex and interdisciplinary information and knowledge, facilitating the materials design process.

The resulting narrative highlights various materials designers' competencies essential in interdisciplinary and multi-stakeholder projects. These competencies cover multiple aspects, such as preliminary holistic research on materials, investigation of possible partners and suppliers, field visits, synthesis of technical, mechanical, and experiential characteristics, creation of narratives, knowledge transfer to different stakeholders, and translation of materials information into physical outputs.

In the case study, materials designers translational practice created bridges between disciplines working on an expected final output, i.e., "a new circularity-oriented material to transition towards a circular and more environmentally sustainable product design". This process required inserting a novel technology into a new context, demanding research, creativity, and cleverness. From this reflection, we agree with Hornbuckle, considering that translational design practices (in this case, embraced by the materials designers) can create 'proximity' between participants and stakeholders to collaborate and achieve innovation (Hornbuckle, 2022).

In the design process, the materials designers employed the translational practice to align requirements and possibilities and achieve a new material with precise characteristics that can be applied to products, fostering less environmental impact. Interestingly, materials designers in the case study used intuitive translational techniques. Thanks to the tacit experience they have gained from working on these projects, they could carry out their task successfully. However, as highlighted by the manager during the interview, it was not an easy road.

These findings indicate that the materials designer in product design companies or complex projects needs to develop translational design skills as an essential practice. Methodologies and guidelines that include how to adopt this practice must be developed. This emerging designer must be trained to practice translation in the design process, especially for significant collaborations and with complex objectives. The translation practice by materials designers could further facilitate the operations and shorten the time to market, with less uncertainty, development costs, material waste, and more efficient material cycles. Furthermore, given the findings of this study, we consider that if materials designers have an established role in collaborations with different stakeholders, managing the development process with translational skills, they can enable creative and collective innovation for environmentally sustainable design. For this to happen, solid translational design skills must be in their foundations.

6.3 Recommendations for materials designers in applying a translational design practice

The following recommendations are proposed based on the data analyzed. The aim is to support materials designers in applying a translational design practice. Especially when working in companies or on complex projects where various stakeholders or professionals with different forms of knowledge and understanding collaborate to achieve a concrete, complex, and innovative goal:

- Increase interdisciplinary language. Delve into varied fields through projects, readings, and courses to master the possible languages around materials design.
- Integrate knowledge of manufacturing processes, methods, and technologies. Explore and understand the manufacturing techniques and technologies of partners, including tools, machinery, raw material sources, production processes, and the knowledge and capabilities of stakeholders, to translate them into practical guidelines for the design team.
- Adopt dialogue facilitation tools. Use material sample or tangible items as catalysts for discussion between partners and practitioners to bridge gaps in communication and understanding.
- Work with multidisciplinary teams and experts. Collaborate with specialists to develop specific material characteristics, conduct laboratory tests, and gain an understanding of the results to translate the technical insights into easy-to-understand guidance for the design team. Adopt a boundary-spanning role.
- Implement feedback mechanisms. Establish and facilitate continuous information channels for stakeholders, refining materials design through iterative evaluations and feedback on potential applications.
- Harmonize technical and design ideas. Align laboratory results with design requirements and convert them into practical guidelines for production.
- Guide design decision-making. Coordinate material properties with product design requirements, ensuring that the desired aesthetic, functional, and expressive-sensorial requirements are met and convert them into practical guidelines for manufacturers.
- Decode certifications, standards, and regulations. Translate material certification requirements into clear criteria for designing, producing, and applying materials.
- Communicate the value of a new material design project. Convert the attributes of materials and products achieved through research and development into attractive and transparent narratives for marketing and sales.

7. Conclusions

This contribution aims to unveil the importance of translational design practice in materials design, especially in companies and complex MDD projects. Here, the concept of "translation" in the role of materials designers working in product design companies is explored. A preliminary literature search was conducted to understand the landscape around materials and translation concepts. A specific case study on materials design in a complex project was then developed and analyzed. Data was collected through a participatory field observation at the product design company that developed the case under study. In addition, an interview with the design manager and head of the material design team enriched and reinforced the observations.

The findings made us assume that the materials designer in complex projects must develop translational solid design skills to approach the design process efficiently, especially when encountering diverse languages and knowledge from different disciplines and stakeholders. The study results indicate that materials designers implemented translational practices in different scenarios. These practices were acquired through experience rather than training. This insight prompted reflections on the creation of guidelines for this practice, leading us to emphasize that tools, methods, and methodologies suitable for this research context and practitioner must still be developed. This finding indicates the next steps for future research.

As a result of the study, a set of recommendations for materials designers to apply translational design practices effectively are proposed. The aim is to facilitate complex objectives in projects with multiple stakeholder interaction.

This study aims to contribute to the debate and definition of translational design practice and the definition of the role of the materials designer as a professional in product design firms.

This work's limitations lie in using a single case study. The proposed recommendations are captured from a very well-developed company. It would be considerable to conduct research in several companies or complex projects in different contexts looking for new translation scenarios. Also, the recommendations should be further implemented, tested, and verified to confirm their feasibility and possibly create guidelines for design.

In conclusion, this study highlights the importance of translational design skills and practice in materials design. At the same time, emphasize that this is only one aspect of the skillset and practices required for this profession.

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