

*Images As Catalysts: A Pedagogical Exercise Enhancing Writing Skills for  
First-Year PhD Design Students at the University of Porto*

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**Abstract**

This paper introduces a pedagogical exercise that employs images as catalysts to facilitate the writing process for first-year PhD Design students at the University of Porto. The exercise pursues two fundamental objectives: firstly, to aid students in refining their research scope into a manageable territory, and secondly, to empower them to articulate the boundaries and intersections of their research, ultimately kickstarting their writing endeavours. The study has been carried out in the context of classes comprising approximately ten students who were applying design methodologies to address problems beyond the traditional design realm, encompassing areas such as medical equipment and communication design. These students were in their first year and engaged in the discipline of Research Methodologies; this exercise served as a valuable tool to enhance their writing abilities. The exercise's significance arises from the acknowledged challenge design students encounter when attempting to articulate their thoughts in writing. Their cognitive processes are inherently visual, and they often interact with knowledge primarily through images. In the context of writing a PhD thesis, where proficient writing skills are a prerequisite, these images serve as catalysts and gateways to the writing process. The study employed a comprehensive methodology that involved retrospective observation, visual analysis, and interviews with the participating students. The anticipated outcome of this research is the development of a model for effectively conducting this pedagogical exercise, with the intention of aiding future design students in honing their writing skills by leveraging visual analysis as a valuable tool.

Keywords: Design Research, Visual Analysis, Phd Pedagogical Exercises

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## Introduction

This article describes and analyses a pedagogical model of exercises conducted with doctoral design students enrolled in the PhD in Design program at the University of Porto (UP). The primary objective of this exercise was to stimulate and enhance the writing skills of these students, a task that has often posed challenges for them.

The significance of this exercise is rooted in the recognised difficulty that design students face when attempting to articulate their thoughts in writing. Design students typically engage with cognitive processes that are inherently visual (Ibrahim, 2020), relying on images as their primary mode of interacting with knowledge. In the context of pursuing a PhD in Design, where proficient writing skills are essential, these visual stimuli serve as catalysts and gateways to the writing process.



**Fig. 1.** Workshop of Visual Methods at the Faculty of Fine Arts, University of Porto, October 2022. Source: author, 2022.

## The Problem

The field of design research poses challenges, especially in transitioning from visual ideation to articulate written expression. Visual analysis workshops contribute to the broader discourse on effectively integrating visual methodologies in design research, challenging the prevailing practice of individual research (Noble, 2005). In these workshops, students lend their thinking to a each others' projects.

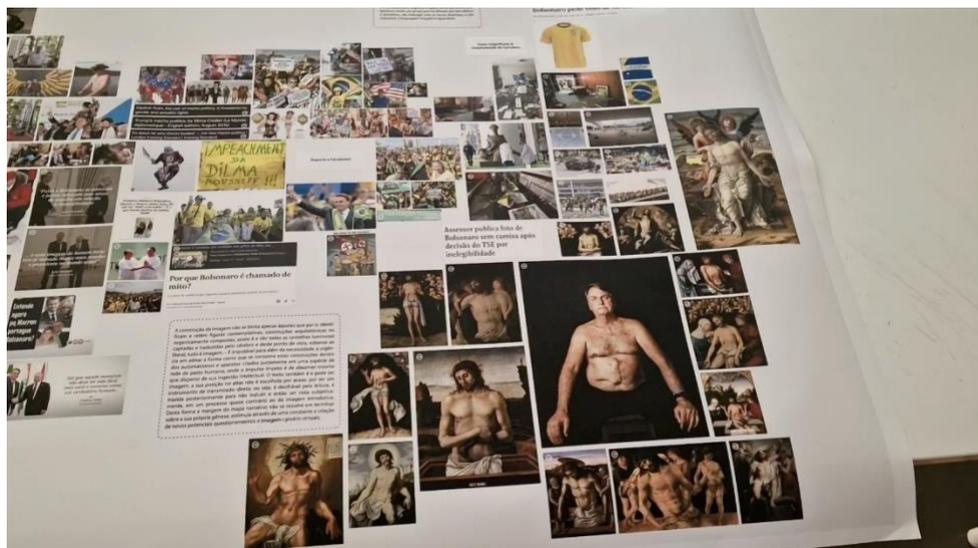
The exercise serves as a transformative tool, acknowledging and leveraging the inherently visual cognitive processes of design students. It gives them a gateway to proficient writing skills essential for pursuing a PhD in Design. Design students navigate the complexities of form, function, and aesthetics through visual representations. However, when translating these thoughts into written language, they may encounter difficulties. This exercise recognises and addresses this challenge by acknowledging the cognitive processes of design students and creating a bridge between visual thinking and written expression.



**Fig. 2.** Workshop of Visual Methods at the Faculty of Fine Arts, University of Porto, October 2022. Source: author, 2022.

A comprehensive and articulate written discourse is essential for presenting research findings, communicating complex design concepts, and contributing meaningfully to the academic discourse. However, the conventional methods of teaching writing skills may not align seamlessly with the cognitive processes of design students, leading to a gap in their ability to express their ideas effectively. Whether sketching ideas, creating mood boards, or developing prototypes, the visual language, visual quotes (Esser, 2012), is central to their creative process.

The exercise encourages students to construct a visual atlas—a dynamic representation of their research interests through images following Aby Warburg’s Atlas Mnémosyne. This visual atlas allows for the intuitive arrangement of images, creating a personalised and evolving visual narrative.



**Fig. 3.** Atlas presentation by Guilherme Oliveira at the Faculty of Fine Arts, University of Porto. Source: author, 2023.

The Atlas Mnémosyne, created by the German art historian Aby Warburg (1866-1929), or as he liked to be called, “image or picture historian” (Russell, 2007) can be viewed as a significant intellectual and methodological upheaval, not confined solely to the field of art

history but extending its impact across diverse disciplines dealing with images in various capacities. Serving as a "visual form of knowledge," the Mnemosyne Atlas introduces a novel epistemic paradigm, concurrently unveiling a fresh aesthetic paradigm of visual expression. This paradigm shift, evident since the mid-20th century, has led to the gradual dissolution of previously distinct practices and discourses, fostering collaboration among historians, curators, theorists, and artists within a shared realm of activity.

Comprising over 1000 images distributed across 63 plates, the Mnemosyne Atlas initially presents itself as an "inventory of traces of Antiquity" that influenced the Renaissance's style of representing dynamic life, according to the author's introduction. Notably, the images span from Mesopotamia in the 17th century BC to regions around the Mediterranean, extending to Northern Europe and the 19th-century era of Manet. As a form of knowledge stimulating the imagination and embracing multiplicity, disparity, diversity, and proliferation, the Atlas invites a Baudelairian sense of "flânerie"—an exploration and wandering.

The exercise's significance lies not only in acknowledging the cognitive preferences of design students but also in fostering a holistic approach to education. It recognises that effective communication in the field of design goes beyond traditional written forms and encompasses a visual language that is inherent to the discipline. Additionally, the exercise aligns with the evolving nature of design research, where interdisciplinary approaches and diverse methods are increasingly valued. By incorporating visual analysis as a valuable tool in developing writing skills, the exercise prepares design students to navigate the complexities of contemporary design research that often transcend traditional disciplinary boundaries.

## **Context**

The author has been actively engaged in teaching at the Doctoral Programme in Design at UP since 2012 (PhDDesign, 2024). Throughout this period, the pedagogical exercise has been consistently implemented, incorporating minor adjustments based on valuable student feedback.

The student cohort typically ranges from eight to ten individuals, representing diverse nationalities and distinct educational backgrounds. Initially, the exercise centred around selecting five research images, requiring students to justify their choices and elucidate the synergies between them during a 10-minute presentation. The students would then physically display their image boards on the wall, using them as a focal point for their presentations.

The inclusion of students from diverse academic backgrounds, including Economics, Design, Fine Arts, and Sociology, enhances the external validity of the study. This diversity allows for a broader range of perspectives and insights during the exercise.

Deconstructing chosen images in both an intuitive and systematic manner suggests an iterative process. This iterative approach allows for flexibility and adaptation, ensuring that the analytical process evolves based on initial findings and feedback.

The emphasis on stimulating critical thinking by analysing composition, subject matter, and potential meanings in photos suggests a targeted approach to developing analytical skills. This improvement focuses on specific aspects of critical thinking and visual analysis.

Including a step where students compare different photos to identify patterns, similarities, and differences enhances the depth of the analysis. This comparative approach adds a layer of complexity to the exercise, leading to a more comprehensive understanding of visual elements and themes.

Students experimenting with various techniques, such as converting photos to black and white, altering framing angles, and adjusting sizes, showcase a creative and exploratory aspect of the exercise. This experimentation contributes to a more nuanced analysis and interpretation of the images.



**Fig. 4.** Display of students' image boards on the PhD in Design studio walls in December 2021. Source: author, 2021.

These poster presentations emerged as valuable resources for subsequent lecturers teaching other modules. It became a common practice at the beginning of each module for lecturers to inquire about the students' research interests, and the visual context provided by these posters facilitated a comprehensive understanding of the students' ongoing research endeavours.

The exercise has significantly transformed in the last twelve years, expanding into a more extensive initiative—a visual atlas inspired by Aby Warburg's Atlas Mnemosyne. Students are encouraged to construct a visual atlas, incorporating multiple images directly related to their research interests. The arrangement of these images on a metaphorical "wall" is left to the students' intuitive perception.

Various typologies emerge, with some opting for a left-to-right progression, others creating clusters of related topics, and some aligning their visual atlas either vertically or horizontally. The final shape is not prescribed by any specific rules; however, a consensus exists that there is no limitation on the number of images. Students can continually add and refine their atlas, employing editing procedures such as zooming in, cutting out, and other adjustments. As opposed to text editing, images are built in this atlas to the point of saturation of data.

## **Methodology**

The methodology employed in this study is inherently qualitative, encompassing retrospective observation, visual analysis, and interviews with the participating students.

- a) Retrospective observation spans a twelve-year period, reflecting on the evolution of the exercise and its current form. This involves examining the walls with images, recalling past conversations, and incorporating observations from colleagues. The outcome of the exercise, as well as the progress of the research, played a pivotal role in shaping its current structure.
- b) The visual analysis comprises a thorough examination of the students' walls and the outcomes of their individual research endeavours. This analytical process materialised during their presentations, wherein they not only explored the existing synergies but also identified new connections. The group engaged in a form of photo elicitation analysis, actively participating in each other's visual analyses.
- c) Interviews were conducted with participating students, some taking place during the exercise, while others occurred years after the course had concluded. Their feedback provides insights into their attitudes towards the study and the nature of their research.

The convergence of retrospective observation, visual analysis, and interviews in this research has yielded a comprehensive understanding of the exercise's evolution, its current structure, and the impact it has had on the participants. This methodological interweaving not only captures the multifaceted nature of the study but also contributes to a nuanced and holistic interpretation of the findings.

## **Work Sessions**

The work sessions took place in the UPTEC baixa, a structure for supporting knowledge transfer between the University and the market. It fosters the creation of technological, scientific and creativity-based companies, enabling relationships between Portuguese and international innovation centres. We work at the PhD Design studio, and the first stage of the process is to identify gaps of knowledge that need to be addressed in this exercise, for example, how to create a working definition for an evolving thesis. How do we create categories of concepts? Based on these gaps, we first look at the theoretical framework of the problem and identify the actions that need to be taken to conduct the workshop.



**Fig. 5, 6.** UPTEC building premises and work session at the PhD em Design studio.  
Source: author, 2021.

We target one session per student, which means that one student has the participation of his colleagues in a case study methodology. We would have the whole class brainstorming and actively engaged in the building of knowledge through visual analysis. Each student was allocated one session of three hours, but some students were allowed to extend it to two sessions.

The group is gender-balanced, and students range from 25 to 52 years old.

The exercise comprised various phases contingent upon the chosen topic. The initial phase involved image selection, during which students were encouraged to respond intuitively to the images, with guidance such as "Include it if you perceive a connection" and "When in doubt, include it!" Furthermore, students were advised that, in the realm of images, abundance was preferred over restraint, and there was no need for economic considerations. I occasionally emphasised that, unlike our inclination to render text intelligible and cohesive, the creation of the atlas did not impose any form of censorship; it served as a preliminary stage. Subsequently, we could engage in zooming in, generating additional sub-atlases, or editing fragments of the existing one. In essence, the process allowed for freedom of choice.



**Fig. 7.** Scattered images before visual analysis work session at the PhD em Design studio.  
Source: author, 2022.

## Data Analysis and Interpretation

The data analysis and interpretation of the pedagogical exercise involving images as catalysts for first-year PhD Design students at the University of Porto reveal rich insights into the evolution, impact, and significance of this innovative approach to enhancing writing skills.

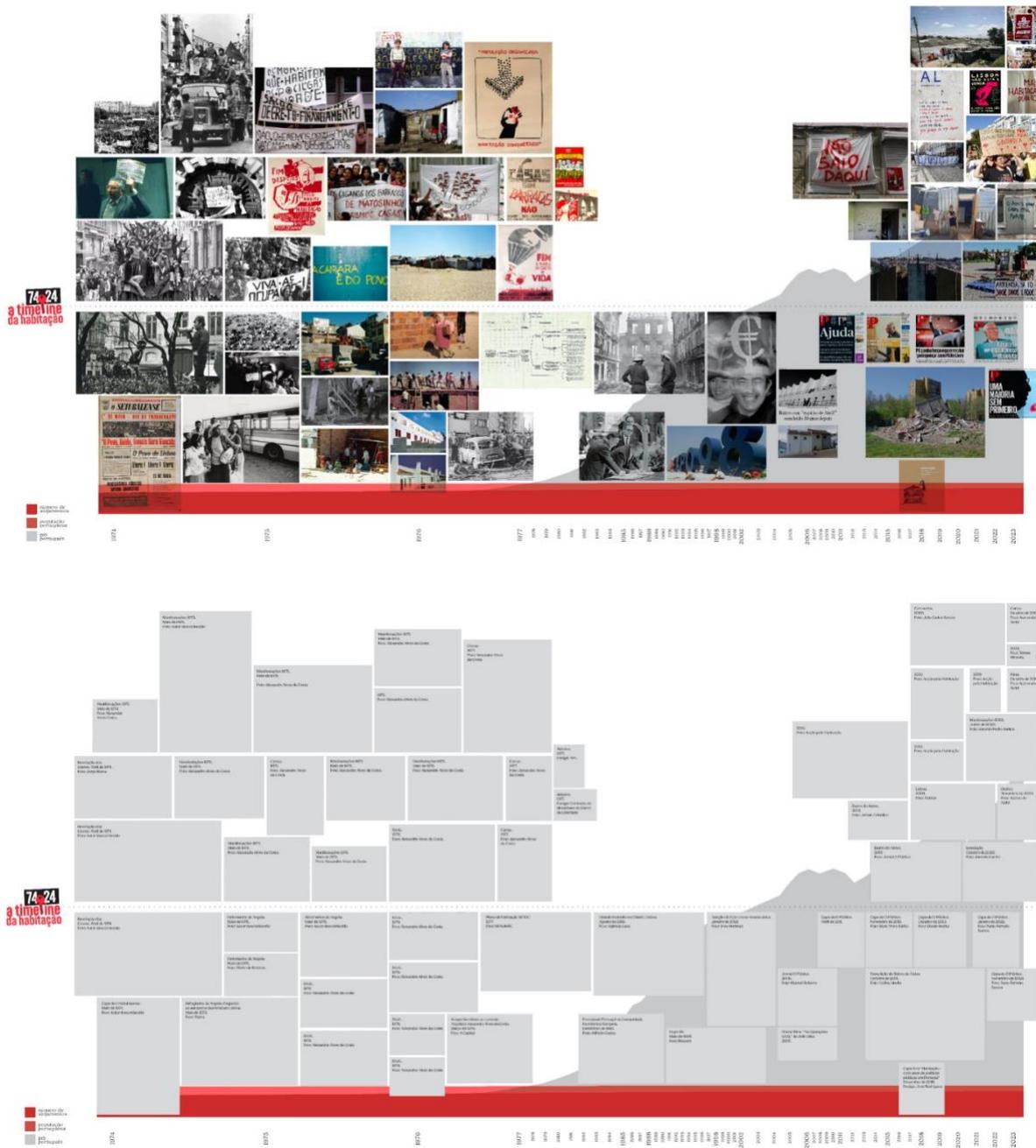
The retrospective observation spanning twelve years provides a comprehensive understanding of how the exercise has evolved. Examining the walls adorned with images, recalling past conversations, and incorporating colleague feedback contribute to a nuanced picture of the transformation. This analysis highlights the shift from individual poster presentations to the more dynamic and flexible visual atlas format inspired by Aby Warburg's Atlas Mnemosyne. The evolution is not merely structural but reflects a deepening engagement with the cognitive.



**Fig. 8.** Work session of visual analysis with MA students at the Faculty of Fine Arts, University of Porto. Source: author, 2022.

The interviews conducted with participating students provide valuable insights into the impact of the exercise on their writing skills. Students acknowledge the inherent challenge of articulating their thoughts in writing and express how the visual stimuli provided by the exercise serve as catalysts and gateways to the writing process.

The exercise not only addresses the unique challenges faced by design students in expressing their thoughts in writing but also contributes to a collaborative and innovative learning environment. The individualised typologies of visual atlases, coupled with the positive impact on writing skills, position this pedagogical exercise as a valuable model for future design students seeking to hone their writing abilities.



**Fig. 9, 10.** Image Atlas and Legend/description by Tulio Filho, MA in Image Design, 2023. Source: Author, 2023.

**Case Study: Two Workshops**

Two visual analysis workshops held with doctoral students in the Design program at the University of Porto in 2022 have provided substantial insights into the domain of design research and the employment of visual methodologies. These workshops, characterised by a hands-on approach and collaborative involvement, have played a crucial role in shaping the research landscape for the participating doctoral projects. They not only facilitated the integration of researchers' perspectives into the analytical process but also fostered deeper engagement among participants. The multifaceted feedback stemming from this process acted as a catalyst, eliciting memories and emotions, thereby enhancing the richness of the research endeavours.

Moreover, these workshops have emphasised the importance of collaboration and interdisciplinary approaches in doctoral design research. Including students from diverse academic and cultural backgrounds has brought a wealth of fresh perspectives and insights to the research process.

The initial workshop, characterised by collaborative interpretation, showcased the potential contributions of colleagues in selecting and refining samples from the photographic collection. This collaborative effort significantly contributed to identifying suitable images for analysis and communication, enhancing the accuracy of emerging typological classifications, and leading to the adoption of a central type of definition for the research object.

The subsequent workshop facilitated the emergence of core concepts and terminologies rooted in analysing research images collected through fieldwork. These concepts, originating from the feelings, impressions, and perceptions expressed by the focus group, have played a crucial role in clarifying the research concept and proposing a taxonomy of approaches to existing project management templates.

In summary, the collective and exploratory application of visual methods in the analysis and communication of research findings, exemplified by these workshops, underscores the potential for harnessing enhanced data to generate new knowledge and plan tangible outcomes for research projects.

The insights garnered through these workshops are not only beneficial to the participating doctoral projects but also contribute to the broader discourse on the effective integration of visual methodologies in design research and facilitating the writing process. The workshops highlighted the potential for the development of doctoral studies in a collaborative environment, challenging the prevailing practice of individual research. Subsequent workshops will be conducted with this collaborative premise, aiming to provide recommendations applicable in further doctoral contexts.

## **Five-Step Model for the Writing Process**

### **Step 1: Selecting Images**

Begin by choosing a diverse set of images relevant to the writing topic or theme. Encourage participants to select images that resonate with them or evoke specific emotions. Emphasize an intuitive selection process, prompting participants to trust their instincts.

### **Step 2: Making Paths**

Once the images are selected, guide participants in organizing them into a visual sequence or path. This could be a chronological order, a thematic progression, or any other logical flow that helps convey a narrative. The goal is to create a visual storyboard that represents the intended structure of the written piece.

### **Step 3: Identifying Patterns**

Prompt participants to observe the selected images closely and identify recurring patterns, themes, or motifs. This step involves a critical analysis of the visual elements to uncover underlying connections. Encourage discussions on how these patterns might translate into written content or thematic threads within the text.

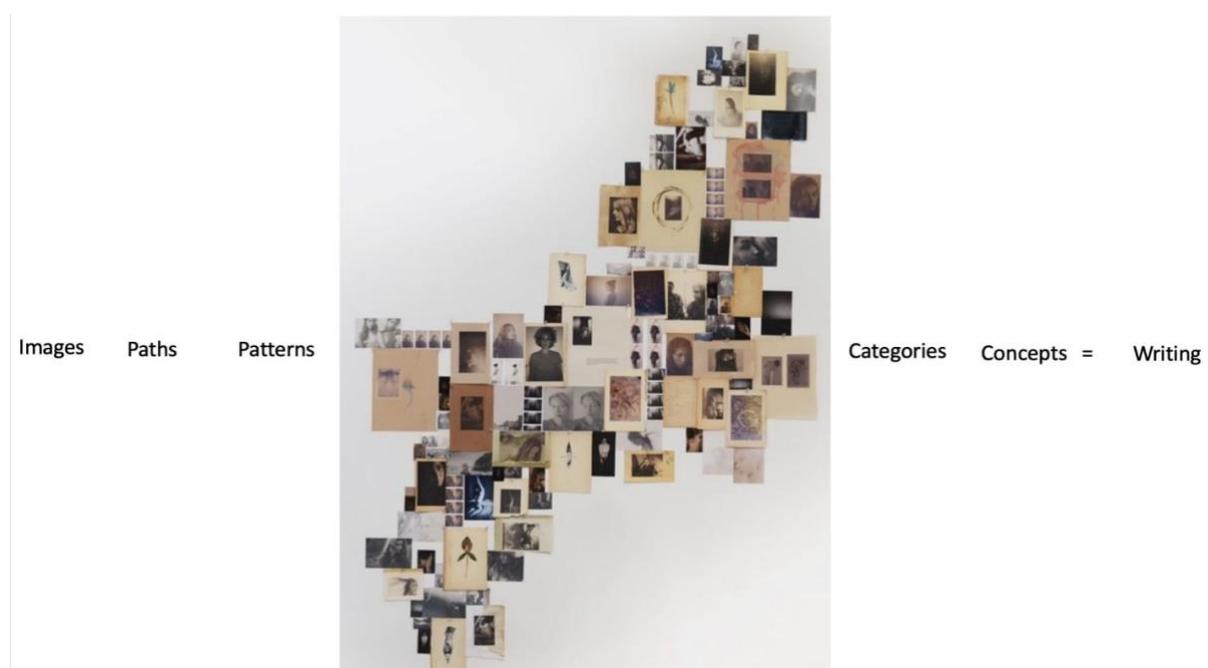
#### Step 4: Creating Categories

Based on the identified patterns, guide participants in creating categories or sections for their writing. These categories should serve as organisational frameworks for different aspects of the content. Discuss how each category contributes to the overall narrative and helps maintain coherence in the written piece.

#### Step 5: Building Concepts

In this final step, participants use the selected images, organised paths, identified patterns, and created categories to build conceptual frameworks for their writing. Encourage them to articulate the central concepts, themes, or arguments that will form the backbone of their text. This step involves synthesising visual observations into written ideas, laying the foundation for the writing process.

This Five-step model exercise not only enhances the writing process but also encourages a dynamic interplay between visual and verbal thinking, fostering a creative and structured approach to content development.



**Fig. 11.** Five-step model exercise employing images to facilitate the writing process.  
Source. Author: 2023.

### Conclusions

In conclusion, this paper highlights the transformative potential of a pedagogical exercise that employs images as catalysts to enhance the writing process for first-year PhD Design students at the University of Porto. The exercise not only addresses the fundamental objectives of refining the research scope and empowering students to articulate the boundaries of their research but also serves as a valuable tool for students enrolled in Research Methodologies.

The significance of this exercise is underscored by the inherent challenge design students face in expressing their thoughts in writing. In the context of design education, emphasise the importance of recognising and accommodating diverse cognitive processes, as evidenced by

the transformative nature of the pedagogical exercise. Recognising their cognitive processes as inherently visual, the exercise leverages images as catalysts and gateways to navigate the intricacies of writing a PhD thesis. This acknowledgement becomes particularly crucial as proficient writing skills become a prerequisite in pursuing a doctoral degree in design.

The study, conducted with approximately ten first-year students applying design methodologies to diverse problem areas, offers valuable insights into the effectiveness of the exercise. It serves as a bridge for students tackling issues beyond the traditional design realm, including medical equipment and communication design. The exercise's impact extends beyond immediate skill development, positioning it as a catalyst for interdisciplinary thinking and problem-solving.

The comprehensive methodology employed in this study, encompassing retrospective observation, visual analysis, and interviews, contributes to a nuanced understanding of the exercise's evolution and impact. Anticipating a model, the Five-Step model for the writing process, for effectively conducting this pedagogical exercise, the research lays the groundwork for aiding future design students in honing their writing skills. The proposed model, informed by insights from retrospective observations and student interviews, is poised to be a valuable resource for educators and institutions seeking to address the unique challenges design students encounter in expressing themselves in written form.

Ultimately, this research reinforces the importance of recognising and accommodating diverse cognitive processes within design education. By embracing the visual nature of design thinking and providing a structured approach to developing writing skills, this pedagogical exercise not only enriches the academic journey of current students but also lays a foundation for the continuous improvement of design education methodologies.

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