

## Article

# Addressing the Use of Artificial Intelligence Tools in the Design of Visual Persuasive Discourses

Ana Erika Ruiz-Arellano <sup>1</sup>, David A. Mejía-Medina <sup>1,\*</sup>, Víctor H. Castillo-Topete <sup>2</sup>, María Berenice Fong-Mata <sup>1</sup>, Ervey L. Hernández-Torres <sup>1</sup>, Paloma Rodríguez-Valenzuela <sup>3</sup> and Enrique Berra-Ruiz <sup>4</sup>

<sup>1</sup> Facultad de Ingeniería y Tecnología, Universidad Autónoma de Baja California, Tijuana 21500, Mexico

<sup>2</sup> Facultad de Ingeniería Mecánica y Eléctrica, Universidad de Colima, Colima 28400, Mexico

<sup>3</sup> Facultad de Arquitectura y Diseño, Universidad Autónoma de Baja California, Mexicali 21280, Mexico

<sup>4</sup> Facultad de Ciencias de la Salud, Universidad Autónoma de Baja California, Tijuana 21500, Mexico

\* Correspondence: damejia@uabc.edu.mx

**Abstract:** Artificial intelligence (AI) systems to generate images from natural language are a game changer in graphic design. However, in visual persuasive communication, the image is not just a drawing, but is the message itself. It arises from the need for understanding how AI systems could be adopted in the design of visual communication. Thus, this article presents a model that describes the theoretical–methodological factors present in the design of persuasive visual discourses, which arises from a qualitative study with an analysis of grounded theory from the opinion of experts in the essential areas for visual communication. Thus, we propose a model to guide the design process of persuasive messages throughout seven stages. Additionally, an analysis for contributing to the orderly and informed incorporation of technologies, techniques, and methods relevant to each stage is presented.



**Citation:** Ruiz-Arellano, A.E.; Mejía-Medina, D.A.; Castillo-Topete, V.H.; Fong-Mata, M.B.; Hernández-Torres, E.L.; Rodríguez-Valenzuela, P.; Berra-Ruiz, E. Addressing the Use of Artificial Intelligence Tools in the Design of Visual Persuasive Discourses. *Designs* **2022**, *6*, 124. <https://doi.org/10.3390/designs6060124>

Academic Editor: Bhanu Shrestha

Received: 12 October 2022

Accepted: 24 November 2022

Published: 6 December 2022

**Publisher's Note:** MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



**Copyright:** © 2022 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

**Keywords:** visual persuasive communication; AI systems for design; design methods

## 1. Introduction

The image fulfills a function beyond simple accessory of contemplation; it must capture the attention, maintain it, share a message clearly and objectively, and persuade the receiver. However, the designer can lose sight of some of these applications and lead the process to an unsuccessful result, aesthetically perfect, but that does not fulfill the purpose of communication. It could be partly attributable to the traditional paradigm in design practice being generally oriented towards weighing aesthetic principles and functions above discursive power, the importance of which has not been clearly defined. Additionally, it could be because the design of persuasive visual discourse is often stuck in the controversy of the advantages and limitations of adopting methods, techniques, and strategies in the design process. Moreover, although it is recognized that graphic design is a discipline formally based on concepts and theories that project it as a social and cultural asset, it is common for it to be considered imprecisely as an exclusively technical task, practically an occupation [1].

This can be accentuated by the recent appearance of artificial intelligence systems that generate high-quality images from concepts or ideas introduced by text, such as the well-known DALL-E, crAIyon (formerly DALL-E mini), Starryai, Wonder, and DreamArt, among others. It can mean anyone can access image design without necessarily having a background in graphic design. Although this is a significant advance in obtaining “drawings”, it does not necessarily imply that those drawings can contain a message that faithfully reflects what the sender needs to communicate to others.

In addition, Aaron Hertzmann [2] analyzes how artificial intelligence impacts the creation of images and answers the question of whether an AI can create art by saying that it should be considered a tool for the artist or designer and not an artist itself. Moreover,

Mazzone and Elgammal [3] mention that, even when few people use artificial intelligence tools to generate images, this will change as people learn more about them. They argue that, because art is a collaborative process where two or more people can combine their skills and knowledge, these tools will become one more “collaborator” in the creative process.

From the above, the question arises about the role of these intelligent tools in the design process of persuasive visual messages. Thus, it is necessary first to understand how this process occurs to address this question.

In this way, the role and impact of methods in design have received considerable attention in the literature [4]. The current literature on design methods can be synthesized to identify five key factors that elaborate the basic method phenomenon: the content of the method, the user of the method, the intended goal, the information artifact, and the context of use [4]. However, as far as we know, there is little information about methodological proposals oriented to the design of persuasive visual discourse in the published literature. Cross outlines two stages in the evolution of design methods [5], both characterized by guiding the development of design towards a discipline linked to scientific values in search of an objective and rational sustenance, at the same time that it demarcates the products and the practice of design from a merely inspirational, subjective, and arbitrary origin [5].

However, due to the enormous productivity around design methods, not all subdisciplines benefit in the same proportion. Most proposals around design methods arise in the subdisciplines of industrial or product design [6–10], design engineering [11,12], architecture [13–15] and, to a lesser extent, in graphic design [15–17]. Although all subdisciplines share elements in common, there are points of divergence [18], highlighting the need to develop specific models, methods, processes, and techniques for graphic design, particularly for designing persuasive messages. Thus, it is clear that less extensive development has been detected from studies on design methods applied to visual communication [19].

Regarding graphic design, its theoretical and methodological factors have been addressed since the first half of the last century with various approaches and trends [20]. Some authors propose that having a methodology specific to the discipline is essential both for professional practice and for teaching design [21]; in contrast, others resist the idea that the work of the graphic designer is seen as limited by methodological canons that confine the highly valued creativity to a “straitjacket” as mentioned by Christopher Alexander [22]. Despite this historical dispute between designers who are related to methods and those who reject any methodological resource in the creative process, it is evident that at least at certain moments in the development of a design object, different aspects of the methodology are used [23].

One of the particular aspects of the design method is the rhetoric of visual discourse. In this way, Alejandro Tapia establishes the importance of considering rhetoric as the axis of visual discourse design since reading an object implies a multidimensional activity that can mobilize the individual’s intellect, emotions, ideologies, and ethics [1]. Moreover, by the end of the 20th century, Bonsiepe (p. 72) stated that “practice has advanced much more than theory” [7] and affirms that rhetoric in visual discourse is an area of knowledge little explored; however, it is essential for the design practice [7]. Nowadays, in this respect, Joachim Knape (p. 14) affirms that “when it comes to object design, we cannot speak of ‘pure aesthetics’” [24]. The influence that artifacts (design objects) detonate on users is defined as persuasion. Therefore, it is valid to interpolate the concept of argument/argumentation towards the field of visual communication [24].

The preceding implies that it is necessary to transfer the experiences of design practice towards the construction of the different components of a theory, which tests an analytical–descriptive scaffolding that articulates the visual and conceptual components in the discourse in a balanced manner. In this way, Bonsiepe advocates maintaining a rhetorical approach to achieve a deep understanding of the phenomena that make up the design problem to be solved [7].

Although various proposals address certain stages of the process, little empirical evidence has been found about the use of methods that integrate, with detail, the process

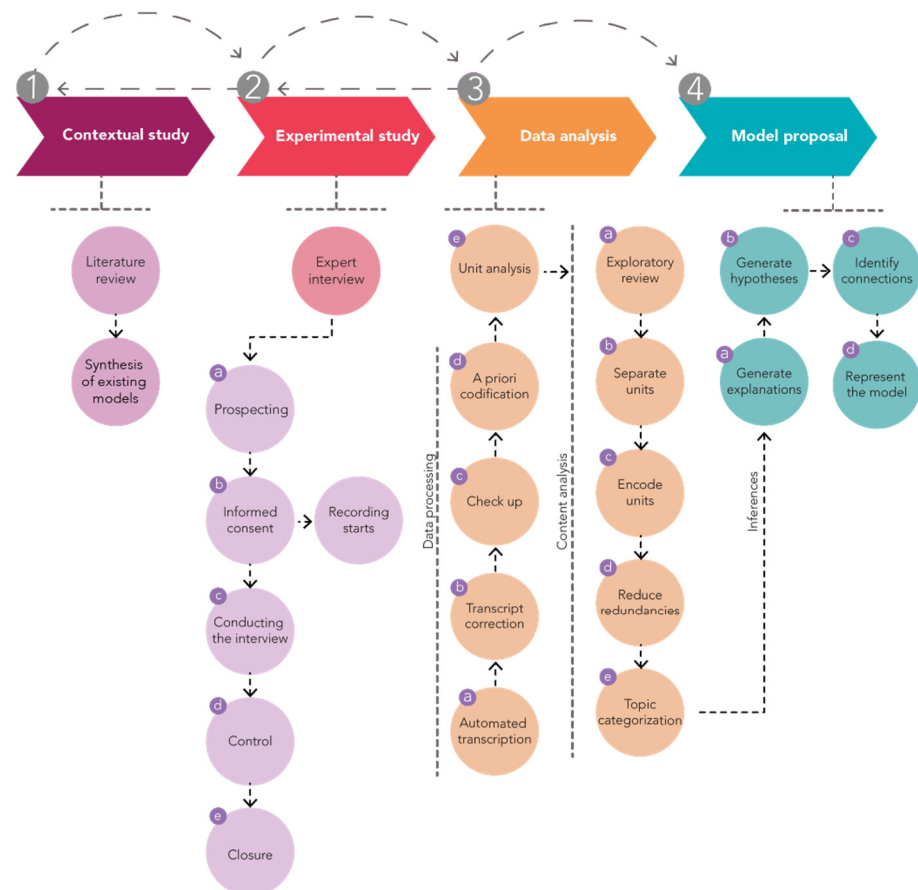
of “translation” of the conceptual approach to the graphic message or the evaluation of the impact of the message on those to whom it is addressed. Thus, this work aims to generate an explanatory and usable model to take advantage of artificial intelligence systems in constructing design artifacts. This model starts by analyzing guides and methods proposed by classical authors and complements this information with the point of view of expert psychologists, communicologists, and practicing graphic designers.

## 2. Materials and Methods

This work is approached from the perspective of qualitative research. It is due to the need to clarify the factors involved in the design method for communication projects to change the audience’s attitude from the persuasive and argumentative design perspective. Content analysis techniques are used to identify, explain, and contextualize the emerging categories from the data analysis revealed in the interviews with design professionals and experts in psychology and communication.

### 2.1. Stages of the Study

This work involved four phases (see Figure 1): the contextual study, an experimental study, data analysis, and the construction of an informed theoretical model.



**Figure 1.** Methodological scheme (own elaboration).

The first stage corresponds to a theoretical–contextual study that includes the theoretical analysis of design methods, intellectual operations in the design process, and the process of materializing conceptual ideas based on an exhaustive search of the published literature. From this stage, the necessary inputs arise to identify the units of analysis, which were studied during the collection of practical information and which give rise to the preliminary proposal of the theoretical model.

In the second phase, fieldwork with graphic design and communication sciences experts is addressed. Individual interviews were applied to each participant with prior informed consent. The purpose of the third stage was to register an approximation of the knowledge related to the relevant concepts in the process of persuasion, design, and communication for the participants and the identification of the processes related to persuasive design and its subsequent communication.

The fourth stage corresponds to analyzing the data collected, which consists of identifying, classifying, and coding units to establish the categories and subcategories of analysis. It was possible to generate hypotheses and explanations that approach the broad knowledge of the phenomenon studied based on the categorization.

It is highlighted that stages three and four are developed in parallel. Additionally, when the amount and depth of knowledge recorded are considered sufficient, the third stage was concluded due to the iterative process of interview coding. The fifth stage corresponded to integrating the design model of persuasive arguments for attitude change, which was developed by identifying the relationships between the categorized theoretical elements.

## 2.2. Sample

Six in-depth interviews were conducted with experts in psychology, communication, and graphic design with a Master's or Ph.D. degree, as detailed in Table 1.

**Table 1.** Profile of the interviewees (own elaboration).

Interviewee's Alias.	Bachelor's Degree Studies	Postgraduate Studies	Current Work Activity	Area of Design
Interviewee A	Graphic communication design	Master's Degree in Education PhD in Psychology	Education	Editorial Design
Interviewee B	Visual Arts Graphic Design	Master's in Marketing	Education Freelance	Poster design
Interviewee C	Graphic Design	Master's Degree in Digital Graphic Design	Design Studio Partner	Branding
Interviewee D	Communication	Master's Degree in Ancient and Modern Languages Master's Degree in Digital Graphic Design	Design Studio Partner	Branding
Interviewee E	Graphic Design	Master's and PhD in Education Methodology	Education Design Journal Editorial Board	Editorial Design
Interviewee F	Communication	Master's Degree in Digital Graphic Design	Freelance	Audiovisual Design

The semi-structured interview was planned to explore the interviewees' design process they follow and if they clearly distinguish phases during this process. Additionally, they were asked what they knew about design theories, as well as the products derived from this whole process and, most importantly, their perception of creativity and its connection with the message they intend to convey so that it is capable of persuading the recipient.

## 2.3. Data Gathering

The data collection was through in-depth interviews conducted with the Google Meet® platform and with the support of a semi-structured interview guide designed to know the experience and theoretical perspective as an expert in design and communication. The conduct of the interview consisted of a dialogue where each participant was allowed to ex-

press ideas and opinions freely. The interviews were recorded with the prior authorization and informed verbal consent of the interviewee.

#### 2.4. Data Analysis

Due to the nature of the study, the content analysis technique was used, according to Díaz-Herrera description (p. 125) “qualitative content analysis is not only intended to search for certain content within a corpus, but to find the meaning that these contents have within the context” [25].

Thus, interviews were transcribed with the support of the recordings to annotate the ideas expressed reliably. Data, such as date, time, and duration, were annotated, and passwords were assigned to designate both the interviewee and the interviewers. Then, a detailed review of the recordings was carried out with their corresponding transcripts to identify and correct involuntary errors.

Subsequently, the concepts expressed by each expert related to the design process and method were identified to favor precoding that facilitates the subsequent analysis with the technological tool.

##### 2.4.1. Word Cloud

It began with an exploratory search based on identifying terms, with the support of a selection list created from the concepts identified in the printed review (Go List). Once this list was created, others, such as conjunctions or prepositions, were excluded. Then, a word cloud was created, presenting a graphic summary of the most representative terms in a discourse. This analysis made it possible to enrich the code created in the precoding process to continue with the in-depth discourse analysis.

##### 2.4.2. List Coding and Open Coding

After identifying the categories and subcategories, we determined the relevant characteristics of perception by the groups of experts. For this, a vertical review of the interviews was performed; it means the reader was carried out from the beginning without making jumps in the reading. During this process, citations of the most relevant mentions by the interviewees were created. These citations were associated with the previously defined codes and the exploratory analysis’s word cloud. By identifying relevant concepts that were not represented in the previous coding (list coding), they were incorporated as new codes (live coding). The citations were identified and coded during this analysis process by linking them with the codes on the list.

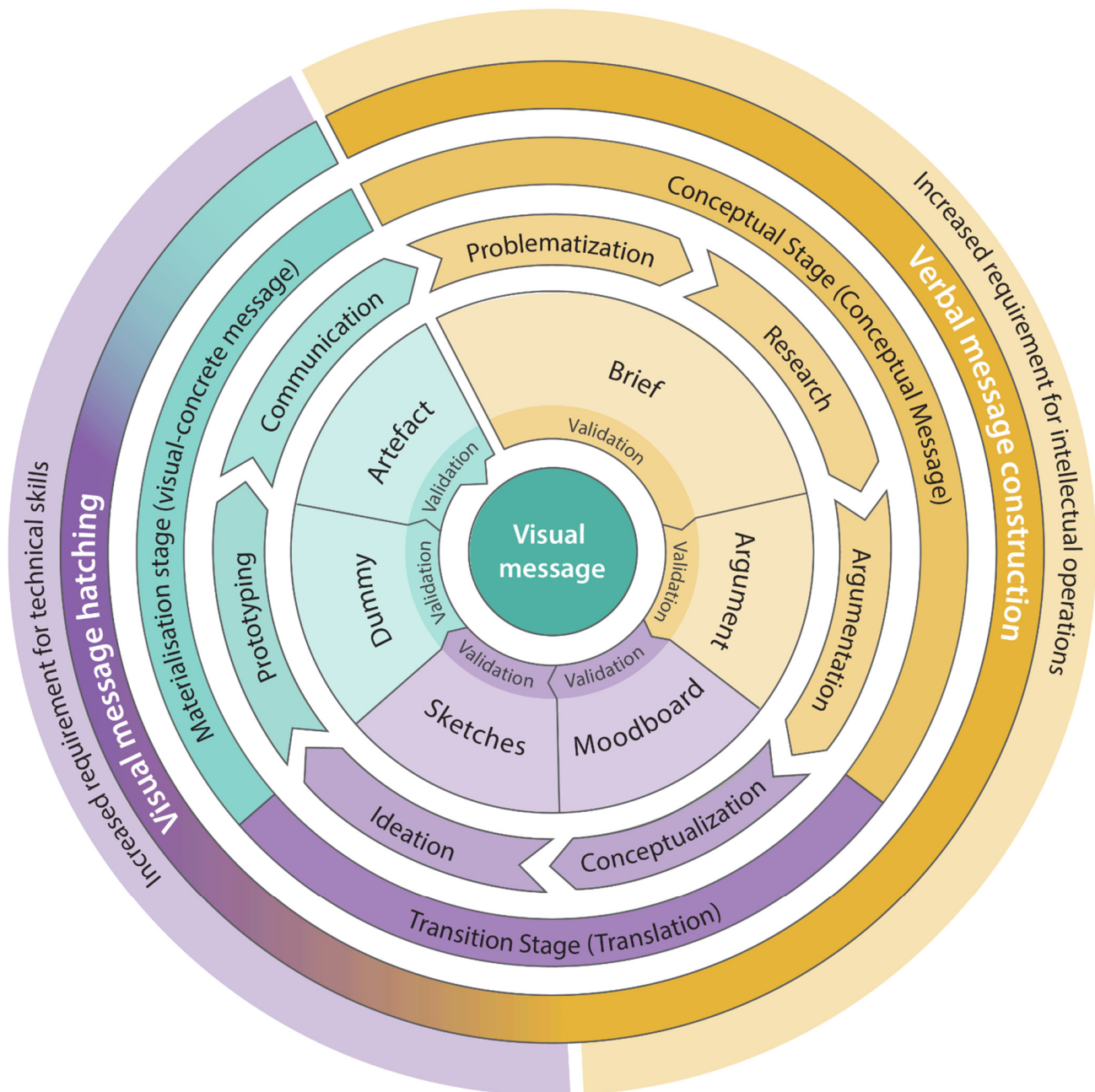
##### 2.4.3. Data Triangulation

Once the interviews were coded, semantic networks were worked on in which all the codes were inserted. At this point, the origin and relationships between the codes began to be identified. It was possible to identify and explain the elements that constituted the model that integrates the theoretical–methodological factors from this informed process.

### 3. Theoretical-Methodological Model Design

This section provides a graphical model (see Figure 2) that helps us understand the process of creating persuasive visual messages, which will also allow us to figure out how and when we can include AI systems in the design process. This theoretical analysis was based on internationally accepted methodologies such as grounded theory [26,27], that have given rise to a large number of studies based on this qualitative methodology. Thus, the model presented below is the product of an informed process that ended in the triangulation of the data obtained through the content analysis of the primary literature consulted and the interviews with graphic designers and communicologist.





**Figure 2.** The model for persuasive design (own elaboration).

### 3.1. Dimensions

This model is based on two dimensions of analysis: (i) verbal message construction, where the message is found, and transformed from its purely verbal expression to its emergence in an essentially visual message, and (ii) visual message hatching, which comprises the actions performed by the designer to hatch the visual message.

These dimensions arose when identifying that, during the design process, cognitive and intellectual activities related to the understanding of verbally expressed communication requirements are carried out, which are necessary for the construction of the message, as well as technical activities that allow the verbal message to be embodied in a visual element.

Thus, the model reflects that the design process requires people with the cognitive skills necessary for understanding and constructing the message, as well as technical skills that allow them to materialize the designed message.

### 3.2. Stages

It was found that there are three stages of the model for persuasive design: conceptualization, translation, and materialization (see Figure 2).

The conceptualization stage develops the necessary inputs to establish the verbal message that will be transmitted; it develops all the scaffolding through which the verbal discourse converted to visual language will be built. The conceptual stage is integrated by the problematization, investigation, and argumentation phases. The problematization implies identifying the communication needs that will be met with the artifact that will be the product of the method. Additionally, in the investigation stage, the perspectives of the interlocutors (sender–receiver) and the experts in the problems are collected. Finally, with the argumentation, the guidelines that will define the verbal content of the message will be established. One important finding is that, during this stage, in order to obtain the products resulting from this stage, this process requires a more significant intellectual and creative effort since they involve high-order intellectual operations from the designer, such as analysis, abstraction, synthesis, simplification, argumentation to generalization, and representation, to mention the most important, as specified on the outer ring of the model.

In the materialization stage, the actions to produce the verbal message, until reaching the final version that will be shown to its recipients, are performed. This stage includes the prototyping and communication phases. It is important to mention that this stage demands mostly technical efforts, which include techniques, skills, and technologies to build visual messages.

Finally, the transition stage is where the “conversion” of a verbal or written message to a visual message takes place. At this stage, semiotics play a very important role, since the designer must carefully choose a visual representation that, from the perspective of the recipients of the message, represents the concept to be communicated effectively. This stage includes the phases of conceptualization and ideation; one of the important findings of the study is that the inspiration to make the mood board can arise naturally or artificially, according to what was commented with the interviewee X:

“Sometimes design comes naturally, while sometimes we use tools such as Pinterest to find design inspiration. We take these images as a base and modify them to make an original design”.

So, at this stage, both technical and intellectual knowledge is required, since it is necessary to go from a conceptual stage to a design product.

### 3.3. Phases

The proposed model has six identified steps, called phases, to be performed for designing visual persuasive messages.

#### 3.3.1. Problematization

It is the starting point of the design process, since it was considered by most of the interviewees as a crucial phase. They agreed to mention that this is where the context of the problem is defined, what will be conducted is defined, how and why it will be developed in that way is defined, and the project’s ultimate goal is defined. Interviewee A’s words about the importance of the context are:

“... when we just contextualize the problem, the situation, and the communication, then everything will fit”.

It refers to the importance of knowing in-depth the phenomenon that will be attended through the process of visual communication. In this first phase, the design project is defined as a strategic entity to address problems from the perspective of visual communication. The interviewee (Interviewee A) stated, “we make problems because we can solve them from the world of visual communication...”. The product of this first stage consists of a detailed report called brief, which integrates the definition of the problem and the recognition of its context.

### 3.3.2. Research

The experts identified this phase as essential for the design method, where the researcher–designer must “situate himself in the real context to observe how people behave” (Interviewee A), in the latter case referring to the ultimate user of the design artifact. Part of the research focuses on developing an audit of what exists, defined by interviewee C as:

“an ideal that inspires us, of course, from the artistic part that we all have, from the creative part, which occurs to us where we can do it, what we could do, and we begin to investigate and break down the information we have, the that the client gave us . . . everything we obtained . . . scrutinizing the internet, always looking for a vein that would lead us to a deposit, and being able to mine . . . it already gave you not only a concept but an entire platform that is based on texts . . . that run like the core of the brand” (Interviewee C).

Additionally, it is pointed out by the participants that it is necessary to carry out a field study involving three actors: (1) the issuer or client, (2) the target audience as a focal point, and (3) experts in the areas of psychology, economics, marketing, as well as experts in the phenomenon that is the subject of communication.

Once the research phase is over, the integration of the brief is concluded, a product that interviewee C defines as “the theoretical part of marketing because it seeks to obtain, let us say, this is the message, this is what we want to communicate, this is what we want to sell.”

### 3.3.3. Argumentation

In this stage, the verbal arguments that will later be represented visually in the designed artifact are built. This means that the concepts provided to the artificial intelligence system emerge at this stage.

Interviewee D explains it as follows:

“A persuasive message must first be grounded in the [verbal] concept because the concept must convince. The symbiosis between communication and design is made clear from persuasion during the interview. First it must be verbal, then it must be graphic. First, it must be in thought—as a system of textual meanings, even if it is something abstract—and then move on to graphics”).

In the design process developed interviewee’s D office, the argument starts from “a kind of search for the archetype of that brand, what personality of the design or of the brands, how it can align or have characteristics and once these three elements”.

For Interviewee A, the argumentation process also has to do with the use of rhetorical figures. “Although the design starts from the syntax, let us say if there is a subject, verb, or predicate in the written phrases, fortunately, we do not have that rigidity in the image. As visual strategies, I consider them important and of great argumentation and significance for the perceiver”. (Interviewee A).

Another task in this phase is the transition from the conceptual to the visual message. The elements that will allow the transition from verbal to visual language are developed. At this point, the translation process begins by identifying the visual elements that can represent the arguments raised in the previous phase. As support resources for this phase, it is recommended to use rhetorical resources such as a commonplace between what is said and what it represents for the audience.

These elements mentioned above are represented in a visual resource known as an inspiration board or mood board, which will integrate the graphic style and typographic guidelines, chromatic and compositional. In the ideation process, and based on the inspiration board, sketches are made that already take a visual route and will allow the transfer of verbal messages to visual representation with different degrees of abstraction, conicity, and simplification to make them materialized in the last stage of the process.

### 3.3.4. Conceptualization

The purpose of this stage consists in bridging a bridge between the concept and the mood board that communicates both products. That is what Chávez, Lecuanda, and



Cortés López cite as a *topoi*, and they define it as “the typical image that refers to a theme” [16], that is, the first thing that comes to mind when you think of a concept. In contrast, this commonplace does not reside formally in the designer’s mind, nor is it an element sociologically constructed as a social imaginary. This bridge needs to be built based on the information provided during the research stage. It constitutes an original creation and is away from ideas that are worn out by excessive use since it is what distinguishes professional design from a merely technical activity.

Additionally, inspiration can be obtained from the results produced by AI systems that generate images from the identified concepts. Although some of the resulting images are not expected to be used as the system generates them, they can be considered a starting point for the final persuasive visual message.

The previous does not imply that this commonplace should be dispensed with, but rather that it should be discovered as a purpose of the investigative process and mediated by a rigorous analysis of the requirements and features of the target audience. Additionally, it must help to clarify how to connect the concept to be represented with the persuaded target audience. Some studies have revealed the importance of using argumentation resources, as is the case of Strömberg, Peterson and Ju [28]; Joachim Knappe [24]. They valued metaphors as part of the representation process because they enable the transition from conceptual elements to the materialization of said concepts. At the same time, concepts highlight the importance of maintaining a functional relationship between resources to enhance their strengths [28].

### 3.3.5. Ideation

This phase is clearly defined by Interviewee B as:

“the creative phase in which the conceptualization of the theme is materialized. That is, when we go from the conceptual to the material in a sketch”.

One of the participants emphasizes the sketching process through what he calls experimentation:

“in some way along that path, perhaps we found the solution [ . . . ] sometimes it can be by accident what we were thinking, but we finally got to it through the process” (Interviewee B).

Additionally, the experimentation in the sketch is seen as:

“the key to everything is to ask yourself and if it were like that, or if it were that way, or if I did this, how would it look then suddenly there you see something you did, and you say I am going to move him a little” (Interviewee C).

Thus, we understand the sketch as an artifact where the ideas in the designer’s mind are decanted. Once the designer has analyzed the different design elements that come together in that commonplace shared by the audience and which are defined during the conceptualization, he articulates them in a coherent and meaningful message capable of persuading the receiver.

### 3.3.6. Implementation

This final phase occurs when the message to be communicated is achieved through a tangible artifact. Here, the designer is in charge of elaborating the dummies or prototypes of the designed artifact; it was found that the designers do not become deeply involved in the part of the implementation of the artifact since the prototypes are the finished version of the design process. Furthermore, it is only followed by a set of technical and sometimes repetitive actions that do not require interpretation of the prototype and contain all the indications for its reproduction. Hence, implementation is not adequately considered a design activity.

#### 4. Theoretical–Methodological Model Foundation

In this section, the resulting model is analyzed concerning the opinion of design professionals and with respect to existing models in the literature. Finally, the relevance of using AI systems in the design process of persuasive visual messages is explored.

##### 4.1. Analysis of the Design Methods Identified in the Literature

From the literature review, some of most often cited methods were identified, such as in [4], which were analyzed in a classification matrix described below (Table 2).

**Table 2.** Summary of design methods analyzed.

Author(s)	Method Name	Year	Translation Stage	Discourse Construction Stage	Application Context
1. Alex Faickney Osborn [29]	Applied Imagination: Principles and Procedures of Creative Thinking	1953	Not found	Not found	Advertising
2. William J. J. Gordon [30]	Synectics, the Development of Creative Capacity	1961	Not found	Not found	Psychology
3. Morris Asimow [6]	Design process	1962	No	No	Engineering
4. Christopher Alexander [13]	Form synthesis	1964	No	No	Architecture
5. Royal Institute of British Architects [14]	RIBA Plan of Works	1964	No	No	Architecture
6. Gui Bonsiepe [31]	ULM Methodology	1964	No	No	Industrial design
7. Leonard Bruce Archer [31]	Systematic method for designers	1965	No	No	Engineering
8. Christopher Jones [8]	Input-output relationship	1970	No	No	Industrial design
9. Víctor Papanek [32]	Integrated generalizing design	1973	No	No	Industrial design
10. Bernd Löbach [9]	Creative problem solving process	1976	No	No	Industrial design
11. Don Koberg y Jim Bagnall [33]	Methods for creative thinking	1972	No	No	General
12. UAM Azcapotzalco [34]	Comprehensive model of the design process	1977	No	No	Comprehensive Design
13. Oscar Olea y Carlos González Lobo [15]	Diana Model	1977	No	No	Architecture
14. Gui Bonsiepe [15]	Projection Method	1978	Partially	No	Industrial design
15. Jordi Llovet [35]	Textual/Contextual Method	1979	No	No	Industrial design
16. Bruno Munari [10]	Project Method	1981	No	No	Industrial design
17. Jorge Frascara [17]	Jorge Frascara’s method	1997	No	No	Graphic design
18. Tim Brown [36]	Design Thinking	2008	No	No	Graphic design
19. Luz del Carmen Vilchis Esquivel [15]	Design process	2014	No	Yes	Graphic design
20. Marco Aquiles Chávez Lecuanda y José Isaac Cortés López [16]	Materializing Line	1996–2017	No	Yes	Graphic design

The authors, publication year, and source are observed for each proposed method in the first column. The second column corresponds to the title the author assigns to his proposal to determine the most used concepts. The third column corresponds to the year of publication of the first edition of the method process. The following two columns identified whether the proposal considers the translation phase and the construction of the persuasive discourse. Finally, the sixth column includes the proposal’s context or professional field of application.

Another difference in the model presented is that the skills and abilities required at each stage of the process, both technical and cognitive, are identified. Finally, the main difference between the proposed model and the analyzed models is that a message translation stage is identified, in which inspiration plays an important role; this inspiration in real practice can arise from a cognitive procedure of the designer or with the support of technological tools.

#### 4.2. Importance of Considering the Balance between Aesthetic, Functional, and Discursive Values in Design Practice

An expert in linguistics, design, and communication sustains incorporating the theory of persuasion into the design process, and it is advisable to start from argumentation. In the words of Interviewee D:

“I would recommend working on argumentation. Our argumentation, to persuade someone, must be honest because it offers new and positive information. The one that is not honest only seeks to disqualify, offer insults or provide negative information. I think it should always be positive because your ability to convince people and to argue should not be based on disqualifying but on proposing new information and then supporting your idea as an argument. Furthermore, therefore, that should lead you to the path of persuasion” (Interviewee D).

The designed image of specific rhetoric fulfills a function beyond the simple accessory of contemplation. It will allow capturing attention, keeping it, sharing a message clearly and objectively, and, at the same time, it must persuade the receiver [7]. However, the designer can lose sight of some of these applications and lead the process to an unsuccessful result, aesthetically perfect, but that does not fulfill the purpose of communication.

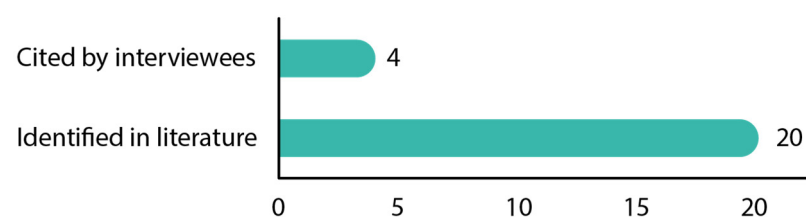
#### 4.3. Importance of the Design Method for Experts

Most interviewees recognize the importance of methods in the designer’s practice, and some tend to refer to the method as a process that must be followed with some freedom so that it does not result in “a straitjacket” (Interviewee F). Interviewee B refers to the importance of the method in the professional and academic field:

“Precisely, having a method allows us to explain, with reasons and arguments, why we had those results, and it is not that you are going to replicate them the same with another design because it is a job. Nevertheless, suppose you can explain your process. In that case, I think that is very good, especially in that academic part that always tries to instill in the boys the idea that the methodology does have a use, that it is not by intuition or divine divination. “

However, several authors have emphasized the utility of methods as they formalize the design process away from a merely inspirational and subjective practice [8,31,37,38]. Efforts have even been made at certain stages, such as problematization [17,37,39], research [17,40], conceptualization [41,42], ideation [43,44], prototyping and, in some cases, up to evaluation [36,37].

In contrast to the diversity of methods and design guidelines identified in the literature, the interviewees only cite the methods of Bruce Archer [45], Jorge Frascara [17], Bruno Munari [10] and the materializing line by José Isaac Cortés and Marco Chávez [16] (see Figure 3).

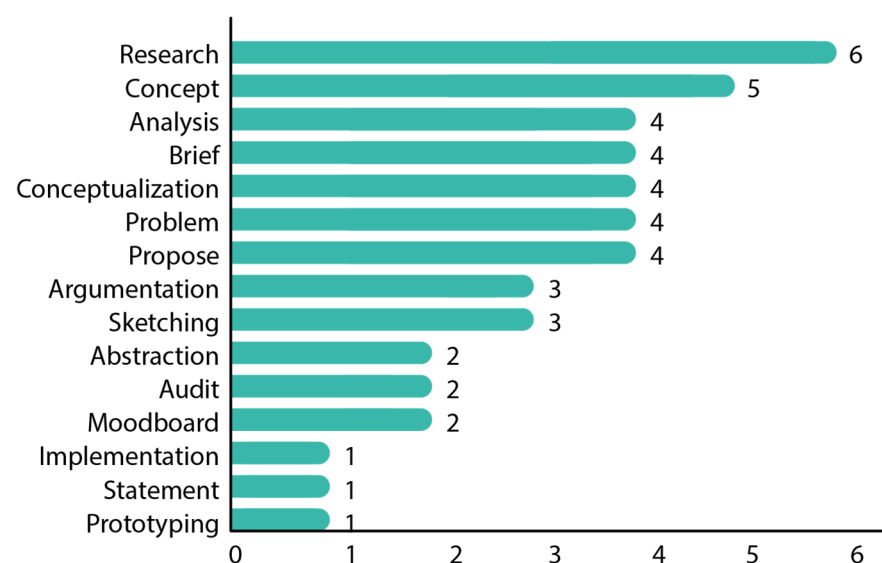


**Figure 3.** Methods or methodological guidelines cited by the interviewees in contrast to those identified in the literature.

Despite subjects oriented to the study of design methods being incorporated into the curriculum of design programs, it is necessary to socialize the available methods during the design instruction. By preceding and expressing the context and application of each applicable method, the designer acquires the methodological discipline from the professional training stage. The texts of design theorists affirm that the traditional design method of drawing is too simple for the increasing complexity of the manufactured world [8].

#### 4.4. The Phases of the Method from the Perspective of the Experts Consulted

The experts interviewed conceive the practice of design as a creative process since their discourse places this attribute at the center, and linked to it are aspects, such as the concept, research, methodology, and information. The experts mention them discursively articulated since the concept arises from research, which allows the collection of information based on a method (see Figure 4).



**Figure 4.** Exploratory analysis of concepts mentioned by interviewees (own elaboration).

Paradoxically, the argumentation and construction of the visual discourse appear in the model's periphery, along with the technical aspects of the design process. The previous may be because, in some educational programs, the degrees in design and the contents related to communicative aspects are not included exhaustively and explicitly, so construction is not considered significant as part of the design process.








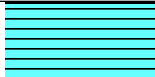


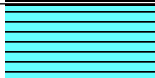


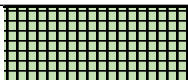
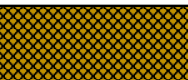
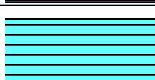

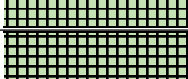








Figure 5 integrates the words associated with the design method mentioned by the interviewees. The process phase with the highest incidence was research-cited by six interviewees, followed by the concept related to the project's problematization. The least frequent were implementation, approach, and prototyping; the above may be due to a conceptual dissociation between the approach and the problematization phase, as well as the limit in the designer's participation that is common in the management of design projects, where rarely is the designer involved in the implementation of the designed artifacts.

The analysis of the different points of view of the interviewees led to the identification of a total of eight phases that frame the model for persuasive design. These phases are related to two categories: (1) the intellectual operations developed by the designer that are presented in Table 3; and (2) the products and design inputs represented in Table 4. It is essential to mention that evaluation is a constant process throughout the development of a design project. Therefore, it is necessary to validate the inputs and outputs to begin or close each phase, from the problematization to the validation.



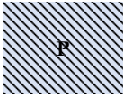
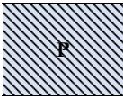
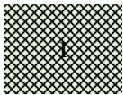



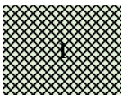




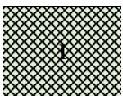
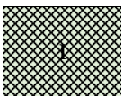


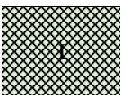
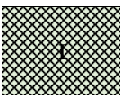

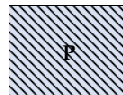
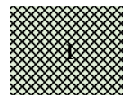
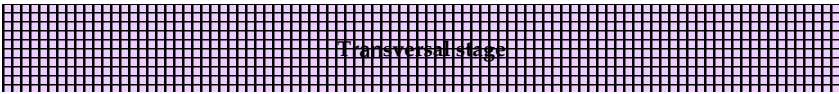
**Figure 5.** Concepts related to the design method mentioned by the interviewees (own elaboration).

**Table 3.** Relationship between the phases of the design method and the intellectual operations of the designer (own elaboration).

Method Stages		Analysis	Synthesis	Abstraction	Simplification	Representation	Evaluation
F1	Problematization						
F2	Research						
F3	Argumentation						
F4	Conceptualization						
F5	Ideation						
F6	Prototyping						
F7	Communication						
F8	Validation						



**Table 4.** Relationship between the phases of the design method and the input and output artifacts (own elaboration).

Method Stages		Brief	Concept	Common Place	Moodboard	Sketches	Dummies	Artefact
P1	Problematization							
P2	Research							
P3	Argumentation							
P4	Conceptualization							
P5	Ideation							
P6	Prototyping							
P7	Communication							
P8	Validation	 Transversal stage						

The model proposed in this work contributes to the theoretical formalization of the design process in general and the design of visual artifacts, emphasizing persuasive communication in particular. At the same time that it contributes to the feasibility of objectifying the process of materializing the conceptual message in a visual message, it is essential to mention that the study only addresses the first three phases of the method, that is, problematization, research, and argumentation. Moreover, conceptualization and only the last two phases are approached tangentially: prototyping and communication, which are not considered within the proposed model because they are part of the visual stage of the message rather than the conceptual stage.

## 5. AI Tools in the Designing of Visual Persuasive Messages

### 5.1. Computers as Tools in the Creation of Visual Artifacts

For several years, computers have been present in our daily lives, to the point of interacting with them seamlessly in many of the activities we carry out daily in three different ways: as a medium, as a social actor, and as a tool. In the case of images, its use as a tool had been mainly for image correction. A vast collection of efforts can be found from different methods [46], which have been the precursors of the popular filters in social networks.

Moreover, the appearance of generative adversarial networks (GAN) has brought a significant advance in the contribution of computers as tools to generate images [46] in such a way that it has irrupted into an area until recently destined only for human beings: creativity. However, since generating and selecting images still requires the intervention and judgment of people, the artificial intelligence systems that generate images should still be considered tools [3].

Moreover, translating a concept into a persuasive visual message is not a trivial task. It is required to go through a conceptualization process, which arises from the designer's inspiration. This way, one of the most relevant findings of this study is that they identified and categorized two sources of inspiration: (i) internal motivation, which arises from the experiences and knowledge of the designer, and (ii) assisted motivation, which comes from elements external to the designers.

In the case of internal motivation, the study participants reported that their designs come from "occurrences" that arise from what they already know, from work conducted previously, or from places or things they have seen, which are adapted and combined to present the new proposal. This means that the greater the knowledge or experiences, the greater the probability of bringing out a visual design proposal that adequately conveys the message. On the other hand, regarding assisted motivation, the participants refer particularly to the use of existing designs in databases.

Thus, the importance of assisting image generation's tools in the persuasive message design process is appreciated as a source of inspiration during the message translation process.

## 5.2. Designers Perception about the Usage of the Model and AI-Generated Images' Tools

To find out the designers' perception regarding the use of the proposed model as part of the design process, an evaluation was carried out with eight participants who performed graphic design activities in an office.

The evaluation consisted of two stages: to identify the design methodology used by designers and to know the perception of the use of the method and artificial intelligence tools for design.

In the first stage, a survey revealed that the eight participants did not name a specific design methodology since they were following their own (customized) methodology. Additionally, they showed agreement in identifying the requirements of the product to be designed, presenting a sketch to the client, and making the design artifact the main activities of their methodology. It is important to note that, at this stage, none of the participants mentioned the word "evaluation" explicitly as part of their design process.

They were also asked about using external sources of inspiration for the product through a categorization from 1 to 7, with 1 "not using them" and 7 "always using them." The result shows a classification of 3.38, which is very close to "sometimes yes, and sometimes no."

Subsequently, they were asked to sketch three persuasive visual messages in the second stage. The topics were (1) stop global warming, (2) prevent bullying, and (3) take care of the environment.

For each activity, there was a limit of 30 min. In each activity, the participants randomly chose the topic and followed the following methodologies:

- (a) Design based on their framework, with the restriction that they cannot use external sources as inspiration.
- (b) Design following the model proposed in this work, using sources of inspiration that do not use AI.
- (c) Design following the model proposed in this work, using AI tools (in this experiment, they use DALL-E) as sources of inspiration.

It is crucial to highlight that after the free design, the design process based on the proposed model was explained to the participants. Something essential in the evaluation is the understanding of the proposed model. For this reason, much emphasis was placed on indicating the inputs and results of each stage. In particular, much emphasis was placed on clarifying the use of databases and tools to generate images: the result of the argumentation stage must be the input concepts for searching in image databases or generating images. Then, these images will serve to generate the mood board that outcomes the conceptualization phase.

For the third activity, the DALL-E application was shown to the participants so they could use it.

At the end of the three activities, the participants were surveyed regarding their perception of the design process. Among the relevant results are the following:

Participants were asked to order from highest (3) to lowest (1) in correspondence to the methodology that made it easier for them to design a sketch of the topic. The results can be seen in Table 5.

**Table 5.** Perception of the participants on the preference of using models to generate persuasive visual messages (the higher the value, the higher the preference).

Participant	Methods			Variety or Originality?
	1	2	3	
1	2	3	1	V
2	1	2	3	O
3	1	3	2	V
4	1	2	3	O
5	1	2	3	O
6	1	2	3	V
7	1	2	3	O
8	3	2	1	V
Avg	1.375	2.25	2.375	

The results show that the methodology that most facilitates the design of a persuasive message is the one that implements the proposed model and allows the use of artificial intelligence tools as a source of inspiration.

When questioned about their choice, they highlighted the following concepts in the same proportion: originality of the image (AI tool) and variety of images (picture database).

Likewise, the participants were asked about if:

- (1) the model reflects the design process,
- (2) the model facilitates the use of AI tools in the design process, and
- (3) AI tools facilitate the design process.

A Likert scale was used for all three questions, where 1 is totally disagreed and 7 is totally agreed.

The results are shown in the Table 6.

**Table 6.** Perception of the participants regarding the use of the proposed model.

Participant	Questions		
	The Model Reflects the Design Process?	The Model Facilitates the Use of AI Tools?	AI Tools Facilitate the Design Process?
1	7	6	5
2	7	5	5
3	6	6	5
4	7	7	6
5	7	7	7
6	7	6	6
7	6	7	6
8	7	6	6
Avg	6.75	6.25	5.75

The results show that the participants perceive almost unanimously (6.75 out of 7) that the proposed model reflects how the design process occurs. In addition, participants mentioned that the model makes integrating AI tools into the design process more manageable. However, they were less strong in believing that AI-powered design tools make the design process easier.

Although the sample is not statistically significant, it is important to mention that this evaluation is qualitative and is shown qualitatively only to facilitate the analysis of the participant's perceptions.

## 6. Conclusions

Systems for generating images from textual concepts through artificial intelligence are gaining notoriety. This has brought to light the debate about the role of graphic designers in the future. Still, at the same time, questions have arisen regarding whether these tools can make a design by itself that, in addition to being aesthetically appropriate, can generate an artifact capable of transmitting a visual message correctly, or at least, how it can be used as a tool for this purpose.

The design of persuasive visual messages is a set of activities that go from knowing the sender's needs to knowing the receiver's characteristics, going through a process of translating the concept to the image. Thus, different design methodologies were analyzed to understand the design process of persuasive visual messages. The analyzed methodologies did not allow us to understand the persuasive messages' design process clearly. Mainly, it was found to be a lack of detail in the transition process from concept to image, the need to generate a new model that also helps to identify the role of image generation tools in producing persuasive visual messages.

Thus, this article is framed in design practice by discussing the technical, aesthetic, and discursive value in design work; subsequently, it involves visual discourse as a communication factor, based on the elements of visual discourse, persuasive strategies, and techniques. The study was approached from a qualitative approach, based on in-depth interviews with experts in graphic design, communication, and psychology. The main results of this research are (i) the analysis of the methods and guidelines proposed by various authors found during the review of the literature, (ii) the correlations between the phases of the design process proposed by the interviewees, (iii) the input inputs and output products of each of phase, and (iv) the use of AI systems as a motivation source during the translation process. In addition, a model of the persuasive design process is presented in which the translation phase from the conceptual to the graphic is incorporated, contributing to the balance of the different factors of the creative process (aesthetic, functional, and discursive).

As far as our knowledge goes, the present study constitutes the first approach to a methodological model for persuasive graphic design, addressing the translation of the message, which is considered an empirical study with design, communication, and psychology professionals and theoretical analysis of the main perspectives of graphic design methods. Then, the model proposed in this work contributes to the theoretical formalization of the whole design process, but mainly to the design of visual artifacts, emphasizing persuasive communication in particular.

Furthermore, the proposed model allows us to understand how to take advantage of the benefits and capabilities of AI-generating image tools in designing persuasive visual messages by clearly identifying an argumentation stage from which the concepts that serve as input for these tools arise. After that, the images generated by AI tools serve as the input for a mood board, which is the starting point for the visual construction of persuasive messages. Thus, it contributes to conceptualizing these tools as collaborators in the creative process and not as artists or creatives.

Finally, the main contributions of the proposal are highlighted regarding the orderly and informed incorporation of existing techniques, methodologies, and state of the art methods relevant to each stage, as well as the benefits and main differences of the pro-

posal concerning process models and methodological guides exposed in the theoretical background of the study, including the use of AI-generated images.

**Author Contributions:** Conceptualization, A.E.R.-A., D.A.M.-M., V.H.C.-T., E.L.H.-T. and P.R.-V.; Data curation, A.E.R.-A. and D.A.M.-M.; Formal analysis, A.E.R.-A., D.A.M.-M., E.L.H.-T. and E.B.-R.; Methodology, A.E.R.-A., D.A.M.-M., V.H.C.-T. and P.R.-V.; Validation, V.H.C.-T., M.B.F.-M. and E.L.H.-T.; Writing—original draft, A.E.R.-A., D.A.M.-M. and M.B.F.-M.; Writing—review & editing, D.A.M.-M., V.H.C.-T., E.L.H.-T., P.R.-V. and E.B.-R. All authors have read and agreed to the published version of the manuscript.

**Funding:** This research received no external funding.

**Data Availability Statement:** Due to privacy concerns, recordings are not available. However, transcripts of the interviews are available by reasonable requesting the authors.

**Acknowledgments:** We thank María Evangelista Arellano and Luis Villarreal for their selfless contribution to the dissemination of this work.

**Conflicts of Interest:** The authors declare no conflict of interest regarding this work’s intellectual and commercial property.

## References

1. Tapia, A. *El Diseño Gráfico en el Espacio Social*; Designio: Mexico City, México, 2004.
2. Hertzmann, A. Can Computers Create Art? *Arts* **2018**, *7*, 18. [\[CrossRef\]](#)
3. Mazzone, M.; Elgammal, A. Art, Creativity, and the Potential of Artificial Intelligence. *Arts* **2019**, *8*, 26. [\[CrossRef\]](#)
4. Daalhuizen, J.; Cash, P. Method content theory: Towards a new understanding of methods in design. *Des. Stud.* **2021**, *75*, 101018. [\[CrossRef\]](#)
5. Cross, N. Designerly Ways of Knowing: Design Discipline Versus Design Science. *Encycl. Dict. Genet. Genom. Proteom.* **2001**, *17*, 49–55. [\[CrossRef\]](#)
6. Asimow, M. The Design Process. In *Introduction to Design*; Reswick, J.B., Ed.; Prentice Hall: Hoboken, NJ, USA, 1962; pp. 42–48.
7. Bonsiepe, G. *Del Objeto a la Interfase: Mutaciones del Diseño*; Infinito: Buenos Aires, Argentina, 1999.
8. Jones, J.C. *Design Methods*, 2nd ed.; John Wiley & Sons: New York, NY, USA, 1992.
9. Lobäch, B. *Diseño Industrial*; Gustavo Gili: Barcelona, Spain, 1981.
10. Munari, B. *Diseño y Comunicación Visual Contribución a una Metodología Didáctica, Segunda*; Gustavo Gili: Barcelona, Spain, 2016.
11. Andreasen, M.M. Design methodology. *J. Eng. Des.* **2007**, *2*, 321–335. [\[CrossRef\]](#)
12. Daalhuizen, J.; Person, O.; Gattol, V. A personal matter? An investigation of students’ design process experiences when using a heuristic or a systematic method. *Des. Stud.* **2014**, *35*, 133–159. [\[CrossRef\]](#)
13. Alexander, C. *Ensayo Sobre la Síntesis de la Forma*; Infinito: Buenos Aires, Argentina, 1986.
14. RIBA. *RIBA Plan of Work 2020 Overview*; Royal Institute of British Architects: London, UK, 2020.
15. del Carmen Vilchis, L. *Metodología del Diseño: Fundamentos Teóricos*; Designio: Mexico City, México, 2014.
16. Cortes Lopez, J.I.; Chávez Lecuanda, M.A. La línea materializante como método de diseño de carteles. Caso de estudio: Carteles Somos Agua. *Zincografía* **2017**, *2*, 5–28. [\[CrossRef\]](#)
17. Frascara, J. *Diseño Gráfico Para la Gente: Comunicaciones de Masa y Cambio Social*; Infinito: Buenos Aires, Argentina, 2008.
18. Eder, W.E. Engineering design science and theory of technical systems: Legacy of Vladimir Hubka. *J. Eng. Des.* **2011**, *22*, 361–385. [\[CrossRef\]](#)
19. Tan, S.; Melles, G. An activity theory focused case study of graphic designers’ tool-mediated activities during the conceptual design phase. *Des. Stud.* **2010**, *31*, 461–478. [\[CrossRef\]](#)
20. Lloyd, P. You make it and you try it out: Seeds of design discipline futures. *Des. Stud.* **2019**, *65*, 167–181. [\[CrossRef\]](#)
21. Jones, J.C. *Development in Design Methodology*; John Wiley & Sons: New York, NY, USA, 1984.
22. Jones, J.C. A method of systematic design. In *Developments in the Design Methodology*; Cross, N., Ed.; John Wiley & Sons: New York, NY, USA, 1984; pp. 9–32.
23. Bayazit, N. Investigating Design: A Review of Forty Years of Design Research. *Des. Issues* **2004**, *20*, 16–29. [\[CrossRef\]](#)
24. Knappe, J. Persuasion by design? Design theory between aesthetics and rhetoric. *Des. Issues* **2021**, *37*, 9–22. [\[CrossRef\]](#)
25. Díaz Herrera, C. Investigación cualitativa y análisis de contenido temático. *Rev. Gen. De Inf. Y Doc.* **2018**, *28*, 119–142. [\[CrossRef\]](#)
26. Glaser, B.G.; Strauss, A.L. *The Discovery of Grounded Theory: Strategies for Qualitative Research*; Aldine Publishing Co: Chicago, IL, USA, 1967.
27. Strauss, A.; Corbin, J. *Basics of Qualitative Research: Grounded Theory Procedures and Techniques*; Sage Publications: Newbury Park, CA, USA, 1990.
28. Strömberg, H.; Pettersson, I.; Ju, W. Enacting metaphors to explore relations and interactions with automated driving systems. *Des. Stud.* **2020**, *67*, 77–101. [\[CrossRef\]](#)
29. Besant, H. The Journey of Brainstorming. *J. Transform. Innov.* **2016**, *2*, 1–7.



30. Reza Arasteh, A. *Creativity in the Life Cycle*; E. J. Brill: Brill, The Netherlands, 1968; p. 49.
31. Rodríguez Morales, L. *De los Métodos Proyectuales al Pensamiento de Diseño*; Universidad Autónoma Metropolitana, Unidad Azcapotzalco, División de Ciencias y Artes para el Diseño, Departamento de Evaluación del Diseño en el Tiempo: Ciudad de México, México, 2015.
32. Papanek, V. *Diseñar Para el Mundo Real: Ecología Humana y Cambio Social*; Pol·len Edicions (El Tinter SAL): Barcelona, España, 2014.
33. Koberg, D.; Bagnall, J. *The Universal Traveler: A Soft-Systems Guide to Creativity, Problem-Solving & the Process of Reaching Goals*; Crips Learning: Los Altos, CA, USA, 1991.
34. Gutieérrez, M.L.; Dussel, E.; Ocejó Cazares, M.T.; Toca Fernández, A.; Sánchez de Carmona, M.; Danel Janet, F.; Sánchez de Antuñano, J.; Webber, M. *Contra un Diseño Dependiente: Un Modelo Para la Autodeterminación Nacional*; Limusa: Ciudad de México, México, 1992.
35. Llovet, J. *Ideología y Metodología del Diseño*; Gustavo Gili: Barcelona, España, 1979; p. 161.
36. Brown, T. *Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation*; HarperCollins: San Francisco, CA, USA, 2019; p. 290. ISBN 978-0-06-285671-5.
37. Cross, N. *Métodos de Diseño: Estrategias Para el Diseño de Productos*; Pérez Vázquez, F.R., Ed.; Limusa: Ciudad de México, México, 2017; p. 190.
38. Boyd Davis, S.; Gristwood, S. 'A dialogue between the real-world and the operational model'—The realities of design in Bruce Archer's 1968 doctoral thesis. *Des. Stud.* **2018**, *56*, 185–204. [[CrossRef](#)]
39. Cross, N. *Design Thinking*; Bloomsbury: London, UK, 2018.
40. Leonard, N.; Ambrose, G. *Bases del Diseño: Investigación en el Diseño*; Parramón Arts & Design: Girona, Spain, 2013; p. 192.
41. Andreasen, M.M.; Cash, P.; Hansen, C.T. *Conceptual design: Interpretations, Mindset and Models*; Springer: Cham, Switzerland, 2015. [[CrossRef](#)]
42. Chen, Y.; Zhao, M.; Xie, Y.; Zhang, Z. A new model of conceptual design based on Scientific Ontology and intentionality theory. Part II: The process model. *Des. Stud.* **2015**, *38*, 39–160. [[CrossRef](#)]
43. Rieuf, V.; Bouchard, C. Emotional activity in early immersive design: Sketches and moodboards in virtual reality. *Des. Stud.* **2017**, *48*, 43–75. [[CrossRef](#)]
44. Schönheyder, J.F.; Nordby, K. The use and evolution of design methods in professional design practice. *Des. Stud.* **2018**, *58*, 36–62. [[CrossRef](#)]
45. Archer, B.L. Design management. *Manag. Decis.* **1967**, *1*, 47–51. [[CrossRef](#)]
46. Cetinic, E.; She, J. Understanding and Creating Art with AI: Review and Outlook. *ACM Transactions on Multimedia Computing. Commun. Appl.* **2022**, *18*, 1–22. [[CrossRef](#)]