Concordia University

Faculty of Fine Arts
Department of Art Education

Program: PhD Art Education

Dissertation

A Comparative Study of Research-For-Design:

Teaching and Learning in two undergraduate Graphic Design Programs in Canada and Mexico.

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Montreal, Quebec, Canada
Fall, 2016

CONCORDIA UNIVERSITY SCHOOL OF GRADUATE STUDIES

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Entitled: **A Comparative Study of Research-For-Design: Teaching and Learning in two undergraduate Graphic Design Programs in Canada and Mexico.**

and submitted in partial fulfillment of the requirements for the degree of PhD in Art Education.

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Abstract

A comparative study of research-for-design: Teaching and learning in two undergraduate graphic design programs in Canada and Mexico.

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Concordia University, 2016

This research focuses on effective ways to teach and learn research-for-design, looking for creative ways to do research and contribute to the field of design education. This study has examined the pedagogical practices of educators engaged with research-for-design and how students learn research skills. The challenge was to determine how to explore current education and draw connections between teaching and learning, and how to identify best practices that contribute to the advancement of design education. The review of theories of graphic design education, design processes, and research in the design process has supported the methodology of an international comparative education research between two undergraduate graphic design programs one in Canada at Concordia University and one in Mexico at the University of San Luis Potosi, through focused interviews to students and educators.

Participants have stated that graphic designers connect people to people, objects and ideas as a dynamic interface. The programs showed differences coming from the art and design streams but both have validated functional and aesthetic dimensions of design. The interviews have shown how designers do research-for-design through observation, questioning, comprehensive thinking, iterative, informal and intuitive processes, collaboration and empathy. Educational strategies should develop questioning and critical thinking, comprehensive and sustainable views, interdisciplinary and collaborative practices, self-develop and interaction with clients, users and stakeholders. In the results, some of the concepts that may improve education of research are: an institutional design methodology, the connection between theory and practice, motivation and engagement of students, balance between creation and research, collaboration among educators, real-world experiences, and effective use of mock-ups. The application of the outcomes of this study in my practice is helping students to understand their role as designers in the community and to develop their potential in design practice.

Acknowledgments

I want to express my gratitude to all the people and institutions that have contributed, in one way or another, to achieve this project. I really appreciate the financial and strategic support from the Universidad Autónoma de Ciudad Juárez (Autonomous University of Ciudad Juarez) and the Programa de Mejoramiento del Profesorado (Promep) since 2008, when this adventure started.

I extend my appreciation to the Concordia University that accepted my proposal and offered guidance and support through all these years. This also applies to the Art Education program that has provided a wide and deep experience in scope transforming my perspective on education. My profound gratitude to Juan Carlos Castro my thesis supervisor, for his time, patience, and wise advice along the path. To my professors at the Art Education program: David Pariser, Linda Szabad-Smith, Lorrie Blair, Paul Landon and Anita Sinner, and my colleagues who have shaped this experience into a unique and precious adventure.

My specially acknowledgement to all those who have collaborated in this project from Concordia University and Universidad Autónoma de San Luis Potosí (Autonomous University of San Luis Potosi), for the encouragement and support. I want to manifest my real appreciation to my parents, my family and my friends for the permanent encouragement through all this process; especially to Salvador my son and my daughters Naty and Daniela, who have been brave and hardworking taking the best of this amazing opportunity.

Finally, I want to manifest one more, my wife Naty and I have accomplished this enterprise together. We have grown through this wonderful experience in love, and acknowledgment of the capability of each other that helped to keep caring of each other and keep admiring each other. At the end of this titanic effort from the whole family, the horizon seems brilliant and wider.

Thanks to God for every little thing in which he or she has been present and we felt it.

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Chapter One – Introduction

The introduction of this study presents the context of the research, the origin of my questions of research, the purpose of the comparative methodology, and the reason why I have chosen these universities from Canada and Mexico at this time.

Context of the Research

As a graphic designer I've been working for more than thirty years in the field. My wife and I cofounded the graphic design agency Grupo Creatio in 1988. I've been involved with industry transformation in the central region of Mexico, as well as in industrial associations as an active member, promoting and demonstrating graphic design functions and their contributions to the field. Within this vocation I found that graphic design was more than the mere activity of developing a visual representation. I became conscious of the impact of design on social development and change. Because of these professional experiences I have come to value designers as communicators that must master an evolving language as Shaughnessy (2010) expressed: "an idiomatic language, a language of cues and puns and symbols and allusions, of cultural references and perceptual inferences that challenge both the intellect and the eye" (p. 18). Further experience in industrial transformation has led me to believe that skills can be expanded through social context awareness, by paying attention to what is happening around us in order to be able to discuss anything in a multi-dimensional way (Press and Cooper, 2007;

Shaughnessy, 2010; Stickdorn and Schneider, 2011) and empower the designer with the capacity and the possibility to respond with an effective design. In tandem, I've taught since 1986 for public and private institutions, trying to promote and facilitate the way students connect and understand design scenarios in a comprehensive way.

As a professional designer and educator my question is how are designers educated to investigate with curiosity and understand design scenarios? The Icograda Design Education Manifesto 2011 states: "The power to think into the future near and far should be an integral part of design education and practice through research" (Bennet and Vulpinari, 2011, p. 8). So, research represents the key, the skill that brings this awareness and the power to produce commercial and social change. That is my motivation to explore and understand how research is actually taught, and to look for best practices in higher design education.

Origin of my Question

Contemporary contexts and the growing complexity of communication and technology demand designers to be informed. Not only all relevant dimensions of the design process, but the full range of issues of the problem and their dynamics in order to produce more effective results for clients and society. Graphic design programs at universities are looking for diverse educational strategies to promote research skills among teachers and students. My intent is to improve and strengthen research education in the graphic design curriculum. Based on my experience as an educator and design professional, this can be done based on the understanding of contemporary features of research-for-design and how they are applied in the design process; on how students learn design, understand scenarios, problems or needs; on how teachers incorporate their best practices in design studio courses and last; on how instructional strategies can be improved with

the aid of research-for-design. I had to look for a methodology that allowed exploration of all those facets of design education in an intimate way. I intend to provide a view of what students and teachers really think and do for the education of research-for-design at design studio courses in graphic design programs.

Research Project

I aim to integrate graphic design educators' intentions and approaches to research-for-design with students' learning and practices within two university contexts. I have examined the learning environment, educators' approaches to curriculum delivery, and student's emerging awareness of the power and potential of research-for-design. Ultimately I have explored the practice of research as found in design studio courses to draw connections between teaching and learning, and identify best practices that may contribute to the enrichment and advancement of design education.

There are several types of research in the field of design. Frayling (1993) described research-for-design as "research where the end product is an artifact" (p. 8). Research-for-design is used to inform the design process by activity that is performed by educators and students throughout the design process. This activity is interwoven with all decision-making, to result in a design with maximum intended effect to the user, solving a need or a problem. The challenge in this investigation was how to explore this phenomenon.

The presented research was an international comparative study of two design programs: The Design Program (Stream of Visual Communication) in the Department of Design and Computation Arts at Concordia University in Montreal, Quebec in Canada; and the programa de Diseño Gráfico de la Facultad del Hábitat en la Universidad Autónoma de San Luis Potosí

(Graphic Design Program at the Faculty of Habitat in the University of San Luis Potosi) in Mexico. Both programs are leaders with innovative curricula, and advanced instructional practice. They show relevant relationship with research-for-design within their curricula and both have specific courses on research and design methodology. It should be noted that these two programs have more courses on research than any other program in the USA, Canada and Mexico (see Table 1). A curriculum review of 15 institutions in the USA, 8 in Canada and 11 in Mexico showed that the selected institutions, Concordia and UASLP, have more than three research courses that show specific interest in this area (see Table 1). The relevance of research in the selected program's curricula provides rich contexts in which to carry out this study's research objective.

These programs have provided rich contexts that are different in cultural, economic, commercial, and pedagogic qualities but share the same interest in the practice of research-for-design. Through this international comparative study, I have explored information about different educational strategies. Among those I have identified best practices for teaching research-for-design, specifically in design studio courses. Comparing diverse undergraduate programs in Canada and Mexico allowed me to understand the purpose and significance of research-for-design in design studio courses environment.

By undertaking this study I have found relevant teaching and learning experiences of educators and students in design studio courses which have demonstrated innovation and have led me to see opportunities for further advancement of the education of research-for-design. The connection of research with innovative and effective design education can lead designers to be prepared for business and social settings to come that involve more complexity and fragmentation.

Table 1

Graphic design curriculum of undergraduate programs in Canada, Mexico and USA universities

UNIVERSITY	Years	Courses related to:								
		Research/ Methodology	Core/Elective	Hands-on Studio classes	Culture and Society	Management	Advertising	Humanities	Design context	Visual Arts Context
USA										
Yale College	4			X						X
Art Center College of Design	4	2	C/E	X				X		X
Carnegie Mellon University	4	2	C	X						X
California College of the Arts	4	1	C	X	X			X		X
California Institute of the Arts	4			X						X
Maryland Institute	4	2	C							X
Minneapolis College of Art and Design	4			X	X	X		X		X
Parsons	4			X						X
Pratt	4	2	C	X			X	X		X
Rhode Island School of Design	4	2	C	X			X			X
SVA School of Visual Arts	4	2	C	X			X			X
School of the Art Institute of Chicago	4			X				X		X
University of Delaware	4	1	C	X			X	XX		X
Virginia Commonwealth University	4	2	C	X				X		X
CANADA										
Art Institute of Vancouver	4			X	X	X	X	X		X
Concordia University	3	6	C	X	X					X
Kwantlen	4			X						X
OCAD University	4	3	C	X	X	X	X			X
UQAM	3	1	C	X	X		X			X
University of Alberta	4			X				X		X
York University	4	1	C	X	X	X		X		X
Simon Fraser University	4								X	
MEXICO										
Univ. Anáhuac	4			X	X		X	X	X	
Univ. Iberoamericana	4	2	C	X	X	X	X	X	X	
Univ. de Guadalajara	4	2	E	X						X
Univ. La Salle	4	2	C	X	X	X		XX	X	
Univ. de Guanajuato	4			X	X	X	X		X	
Univ. A. Metropolitana	4	3	C	X	X			X	X	
UVM	4			X		X	X		X	
UPAEP	4	1	C	X	X			X	X	
UASLP	4	5	C	X	X			X	X	
UA Edo. de Mexico	4	3	C	X		X		X	X	
UNAM	4	3	C	X	X			X	X	

Purpose

The purpose of this study was to explore at two universities in Canada and Mexico, which have several course offerings in design research. There were two main objectives for this study: First, I have described and analyzed the scope and methods of teaching and learning related to research-for-design enacted by educators and students in graphic design education at the undergraduate level; and second, I have identified the strengths and limitations, similarities and differences of research-for-design pedagogic practices between the two programs: the Visual Communication at Concordia University in Montreal, QC, and the Graphic Design program at Universidad Autónoma de San Luis Potosí in Mexico. I have investigated how research-for-design was included in design studio practices; what were instructors' attitudes, experiences and instructional strategies regarding teaching research-for-design; and students' attitudes, motivations, and interests regarding learning research-for-design. Through this investigation I had searched for an understanding of the problems presented in the field of graphic design as well as the possibilities regarding research-for-design education to help address these ever emerging commercial and social scenarios.

This international comparative study has provided a broad perspective of design education because of the diversity of cultures, values, languages, and educational structures from each context. The purpose of using a methodology of comparison was to create a contrast of how research-for-design was manifested across international undergraduate settings using two institutions in Canada and Mexico that show specific interest in research by having more research courses than other programs. Together these perspectives allowed comprehensive

examination of research instruction in design education providing valuable information for this study.

Research Questions and Objectives

The understanding of current teaching and learning practices of research-for-design will contribute to design education and professional design practice by identifying best practices, weaknesses and strengths in design education of research. With this in mind I have engaged with educators and students, but this represents two different perspectives that requires splitting the study and exploring both dimensions: educators and students, teaching and learning. My first question is:

What is the pedagogical practices of instructors engaged with research-for-design?

Design educators are determinant actors in higher education through the formation of future designers. Their design experiences, abilities and perspectives shape curriculum and instructional strategies in design education. I have explored what educators' experiences and attitudes towards research-for-design are by asking about teaching styles and strategies related to design education and research. I have searched for instructional experiences, practices and curricular content with regard to research. The results of these enquiries have provided the groundwork from which curricular innovations and reforms can be referenced. The investigation has detailed not only effective strategies for teaching graphic design, but also limitations of such approaches and contextual considerations.

The educational phenomenon involves the learning dimension of students, so the second question I pose is:

What and how do students learn regarding research skills in the formal design curriculum?

In this matter, I have sought to understand how students engage with and enact research practices in design. I have examined students' experiences and attitudes towards research, how research is approached through their personal narratives, the impact of research on students' personal design processes, and the common and divergent aspects of learning research-for-design. I have explored how research-for-design is presented in students' arguments and explanations of the creative process. I have investigated how students articulate their understandings of design problems and resulting solutions, as well as explored what kinds of skills promote the practice of research-for-design and the relation between research and design thinking (Lupton, 2011a; Shea, 2012; Stickdorn & Schneider, 2011). I have also investigated the extent to which research promotes innovative thinking, collaborative work, communication skills, art skills, and creativity for problem-solving as they are instigated by instructors' efforts both formally and informally through the curriculum.

The initial investigation for this research made me realize that it is necessary to understand the context in which teaching and learning is undergone. What is the dynamic between courses, how research courses contribute in the understanding and application of research-for-design? Thus, third question is:

How does the curriculum, as enacted by educators and experienced by students, support the education of research-for-design in respective design programs at Concordia University and at UASLP?

By investigating and comparing the graphic design curriculum I have led this investigation towards a triangulating analysis between planned curriculums of graphic design,

educator teaching practices regarding research-for-design and students' ways of learning, skills and attitudes. I have researched the way design studio courses bring value to the curriculum in general, and particularly the kinds of instructional methods used in teaching research-for-design. I have reviewed how diverse courses in the curriculum contribute in the promotion of research-for-design and how these courses are linked to design studio courses. Close examination of terms and definitions has yielded the understanding of the curriculum in research-for-design education by setting categories for effective comparison.

Summary

In this chapter I have presented the general context of this study, subject, purposes, methodology, and selection of cases, research questions and objectives. In the next four chapters I presented the theoretical framework that shows my literature review where I concentrate on research-for-design and the characteristics of design education. Next is the methodology, where I have explained the comparative case study, how it was used, and criticisms of it and how I have addressed them. In the analysis chapter, I have explained the way to review data collected through interviews of educators and students of both institutions by triangulating information from the curriculum, educators and students. In the last chapter I have set forth the conclusions about the impact of research-for-design practice, the processes and specific features of research-for-design and limitations it poses for education. As a final word, I have delimited how research-for-design contributes to design education and the formation of future designers as well envisioned new possibilities for research-for-design in graphic design applications.

Chapter 2 – Theoretical Framework

With the purpose of understanding the role of research-for-design in graphic design education, in this chapter I discuss the terms of reference coming from instructors and designers, as well as researchers of design, in published articles and books necessary for this study. I also describe the review of theory of learning which undergirds my investigation of these two programs. To facilitate the understanding of this project is necessary to set the definition of main terms as follows:

Locations and Participants

Locations are defined as the Design Program (Stream of Visual Communication) in the Department of Design and Computation Arts at Concordia University in Montreal, Quebec in Canada (from here forth to be referred to as Concordia); and el programa de Diseño Gráfico de la Facultad del Hábitat en la Universidad Autónoma de San Luis Potosí (Graphic Design Program at the Faculty of Habitat in the University of San Luis Potosi) in Mexico henceforth referred to as UASLP.

Participants in this document in the role of professors and course instructors will be referred to as educators throughout this investigation. The students who were interviewed for these case studies were a sample and do not represent every student in each of the programs in this investigation. For this reason, I have referred to the students as student participants.

Graphic Design

The Society of Graphic Designers of Canada (GDC) (2016) proposed what a good graphic design curriculum includes with the following definition: “Graphic design is a human-centered

practice — it impacts society and is an essential tool for economic development. Graphic designers create visual communication to engage, motivate, persuade, inspire and inform in all media platforms" (para. 2).

In 2011, the International Council of Graphic Design Associations (ICOGRADA) suggested an up-to-date term for graphic design as *visual communication design* (Bennet and Vulpinari, 2011); I consider *visual communication design* a better term because it is comprehensive and integrative of the two main dimensions of design: images and communication. Even so, for this study I will keep the term *graphic design* in order to avoid confusion among participants from both countries, because it is the most widely used.

The creative processes of graphic design involve methods combining text, symbols and images in order to convey a visual representation of the message. A graphic designer can combine colour, typography, visual arts and page layout with a variety of technologies to produce a wide variety of human-made visual communication artifacts that ICOGRADA describe as:

> identity design; editorial and book design; typography; information design; advertising; illustration; photography; calligraphy; signage and pictogram systems; packaging; animation design; broadcast graphics and film titles; product, web and game interface design; interaction, environmental and exhibition graphics; data visualization; and any other activity of online and offline shaping of visual form. (Bennet and Vulpinari, 2011, p. 10)

However, what is important for this study is that the discipline of graphic design is ever-defining-borders in an evolving context, with emerging technologies and fragmented society

(Press and Cooper, 2007). And more than anything, people's evolving way of knowing and obtaining information that represents a challenge for new designers.

Graphic Design Curriculum

The evolution of recent design education has been categorized by Lupton and Phillips (2008) into three decades. Design education in the1980s faced postmodernism and its interest in appropriation and historicism. In the 1990s the challenge of learning and teaching software, struggling in finding the balance between technical skills and design thinking was at its height. The new millennium brought renewed attention to include cultural awareness and social content in the curriculum; and now we are experiencing two relevant perspectives in graphic design: formal structures and personal meanings of social content. The current decade is defined by the speed of changes, driven by communication technology and the inherent need for closer approaches to clients and user audiences. Design education must provide a comprehensive formation including all the skills to facilitate future designers face change. Moreover, education must first, teach necessary skills to respond to rapid changes in technology and communication; second, evolve interdisciplinary ways to collaborate and exchange with other areas such as science, business and engineering; and third, foster specializations in design promoted by research and academic work (Bennet and Vulpinari, 2011; Chueng, 2011; Press and Cooper, 2007). In this study I have identified to what extent these institutions in Mexico and Canada address each of these concepts, not only in academic terms, but in current less formal educational practices.

The Icograda's Graphic Design Education Manifesto 2011(Bennet and Vulpinari, 2011) expresses the need for comprehensive development of students' skills. This is facing the

evolution of the whole profession for future designers. Relevant educators and theorists of design, members of this international association of graphic designers such as Gui Bonsiepe, Katia Colucci, Liz Danzico, Meredith Davis, Victor Margolin, Dave Malouf and Teal Triggs, have situated research as one of the most important activities in the advancement of the graphic design in order to address and meet the emergent requirements of society.

Sharing common perceptions of design education is central to this investigation. A summary of this Manifesto (See Table 2) represents the reference in design education for this study and it has been used as the criteria of assessment and analysis of data collected. These nine points have been used to identify the aspects of design education that were relevant in participants' interviews.

Table 2

Icograda Graphic Design Education Manifesto 2011 summary

Icograda Graphic Design Education Manifesto 2011 Summary	
1	Create self-reflective attitude and skills to adapt and evolve with changes
2	Use of multimedia
3	Promotion of cross-cultural and transdisciplinary work
4	Incorporation of theory, history, criticism, research, and management
5	Teaching of quantitative and qualitative research methods
6	Practice of interdisciplinary work
7	Formation of students for technological, environmental, cultural, social and economic change with democratic and integrative learning
8	Disseminating self-learning and updating skills programs and research training
9	Strengthening social and environmental responsibility

Design Studio Courses

Looking at Table 1 is possible to identify that most undergraduate graphic design curricula

throughout North America provide hands-on studio/lab format courses commonly referred to as a design studio. These hands-on design classes are central to the educational model for most of the major courses in the field of design (Kurt, 2009) (see Table 1). In both cases of this study and many other institutions, the content of these courses start from the basics of design, typography, logos, posters, corporate image, symbol design, layout design, etc., that evolve from basic design at initial stages, towards more complex projects. Design studio courses usually combine Problem Based Learning (Kurt, 2009) of design projects with lectures, discussions and critiques. Through these courses knowledge is synthesized and applied in the development of the project. Teachers usually, provide the outline of projects or problems to solve. In design studio courses time is structured in order to provide individualized instruction and assistance, as well as the supervision of research-for-design practice as part of the design process. This is the scenario in which this study has reviewed the teaching and learning of research practice.

Graphic Design Process

Jonas (2007) explained a generic design process "as a sometimes highly rational endeavour that is embedded in overall trial-and-error processes" (p. 199) that any designer goes through in different ways. There is more than one correct process of design; in fact, there are maybe as many processes as the number of design professionals (Cheng, 2006). Several theorists of design have provided models explaining the process from a variety of design perspectives. Hugh Dubberly presented in "A compendium of models," over a hundred design processes (Dubberly, 2004a).

These models vary from three to seven or more steps (see Table 3). However, a synthesis of the main stages through which all designers go, allowed me to provide one model for this study.

The design process starts formulating the problem with the client who expresses intentions and purposes in an interview. In the case of a design studio class, it is the instructor who provides purposes and objectives in a summary called a 'brief or scenario.'

Table 3

Design process models

Design process models					
Institute of Design Chicago	Research	analysis	synthesis	realization	
Jonas (1996)	Analysis	projection	synthesis		
Live/work (2009)	Insight	idea	prototype	delivery	
Design thinkers (2009)	Discovering	concept	designing	building	implementing
British Design Council (2009) "The double diamond"	Discover	definition	develops	deliver	
Stickdorn & Schneider (2011)	Exploration	creation	reflection	implementation	
Press and Cooper (2003)	Formulation	evolution	transfer	reaction	

Then, designer/student collects comprehensive data to understand and state the problem enabling the generation of ideas. Through creative idea generation techniques or evolution, the designer/student creates as many ideas as possible. An iterative process of assessment and development as well as selection of best ideas is carried out based on design thinking and on project requirements (Lupton, 2011a). Best solutions are evaluated with a client's or professor's advice. A transfer is done through the incorporation of design parameters into materials and technologies, including budget and timing. The final design is prepared for production or presentation. The implementation of the object of design requires supervision as well as the launch, installation or class presentation model. Finally, reactions or feedback of users' and stakeholders' responses are evaluated or in the case of a university class, the professor grades the

presentation (Press and Cooper, 2007). The decision-making is supported by the management of information provided by the adequate research throughout all stages of the process.

Based on the Press and Cooper's model, I have proposed a design process with some changes because the first and third stages include two different research activities that I want to describe individually. It should be noted that I chose the Press and Cooper's model because they have a model of design based on more comprehensive uses of research-for-design in the design process. I have divided the stage of formulation in two parts: first, *exploration* that refers to initial enquiry to the case and collection of necessary information in order to understand the problem; second, *definition* which implies the synthesis of information and the identification of the audience/users and scenarios' relevant facts. I also have divided the stage of evolution into *creation*, that means the designer's response with initial proposals; and *develop* that includes design object testing and modifying as many times as necessary in an iterative way. The Transfer stage in the Press and Cooper's model has been converted to an *implementation* stage, which acknowledges the technology and the strategy necessary to launch the final result in the field. Finally, the *evaluation* stage, measures the impact of the design's performance and the reaction of users' experience. These stages involve six different needs for research information. Designers use data for decision-making in each stage of the design process. In this study I have referred to this model identifying the features of research-for-design and the way it is taught and learnt (See Table 4).

Design Thinking

Design thinking has been initially developed by the University of Stanford and inspired by the design process. The columns of its practice are: human-centered, show don´t tell, radical

Table 4

The design process model for this study by the author

Press & Cooper	Design Process model for this study	Example: logo for a shop
FORMULATION	**EXPLORATION**	Understanding owner's concept of a product or service. Understanding targeted customers. Understanding market, context, and competitors.
	PROBLEM DEFINITION	Stating the needs and limits of the project in collaboration with clients.
EVOLUTION	**CREATION**	Looking for ideas from other related shops, from other designers, and from other related visual resources.
	DEVELOP	A process of evaluation and developing best ideas until ending up with the final proposal and the application to the media to be used.
TRANSFER	**IMPLEMENTATION**	Description of the rules about how to use the logo in different media, and the required technical information for correct reproduction.
REACTION	**EVALUATION**	Checking the way the logo is functioning and how client, workers, stakeholders, and customers perceive it.

Six stages design process model proposed in this research for reviewing research-for-design based on Press and Cooper model.

collaboration, mindful of the process, culture of prototyping, and oriented to action. Design thinking has five steps: understanding, defining, ideation, prototyping and evaluating (Plattner, 2017). Design education and professional practice have developed a methodology based on research and critical thinking with an iterative evaluation throughout the process; this methodology is design thinking, which is promoted by educators to guide students through the design process. This is a lens that is central to the analysis and interpretation of data collected in this study. Design thinking develops skills such as research, understanding of the problem, idea generation, reflective judgment, decision-making, attitudes and dispositions and self-regulation (Baum and Newbill, 2010).

Intuition/Rationalism and Decision-Making in Graphic Design

Decision-making in graphic design is a multidimensional process, which involves, on the one hand, rationality, in other words, to stay objective, non-emotional, non-religious, non-instinctive, un-moralistic, and a-cultural, in order to formulate ideas on available information and experience-based actions. On the other hand, intuition comes into play that involves subjective, emotional, instinctual, and cultural biases, which generate ideas that are based on imagination and experiences (Eisenhardt and Zbaracki, 1992). Moreover, intuition is characterized by the: "nonlinear, non-sequential nature of holistic processing" in decision-making (Sinclair and Ashkanazy, 2005). Some design scenarios allow for more rationality, and some require more intuition in the realm of human performance. Thus, intuition and rationality are not mutually exclusive. Decision-making integrates rational/analytical and intuitive/emotional thought in complementary and iterative processes in which one or the other can prevail (Burke and Miller, 1999; Sinclair and Ashkanasy, 2005). Moreover, contemporary studies show how intuition is more and more accepted as part of the paths people follow in decision-making (Agor, 1984; Behling and Eckel, 1991; Burk and Miller, 1999; Isenberg, 1984; Parikh, Neubauer and Lank's, 1994;). Sinclair and Ashkanasy (2005), explains that intuitive processes are not conscious reasoning, where designers process information holistically. I can infer from that; the more information students have the better the results of the process, in which knowledge and skills affect decision-making. Burke and Miller (1999) from his part added that intuitive decisions are based on experience, affected by feelings or emotions, in a subconscious mental process. In design, those facts bring intuition into non-verbal expressions using images and metaphors (Crossan, Lane, and White, 1999), which constitutes the common language of designers. The relevance of it in research is that data collection provides the necessary experience and

information that enhances decision-making, also honours intuition. Some of the benefits of intuition in design are: expedited decisions, improved final decisions, specifically, intuition provides designers a better understanding of context (Eisenhardt, 1999; Press and Cooper, 2007). For this study, I have looked for those practices of research education that feed reason as well as intuition for the decision-making processes. It is at this point where intuition and rationalism come to play in the design process that we find a credible link to the tradition and lineage of art education through the modernist works by Elliot Eisner and Rudolf Arnheim. Eisner (2002) helped to see the art education perspective "in the way vision and meaning are personalized" (p. 44). And Arnheim (1954) provided orientation and understanding on cognitive development through visual thinking.

Graphic Design Process and Research-for-Design

Traditionally, research-for-design has not been relevant, yet today it has gained importance with contemporary designers. In design education some instructors are more focused on aesthetics, some are more confident with intuition and self-expression, and others just do not have enough of an understanding of research methods to apply them in the process of design practice (Chueng, 2011; Press and Cooper, 2007). It reflects Frascara's (2004) concerns regarding professional practice of graphic design when it lacks grounding in theory, as well as the emphasis on aesthetics over performance. Theory in graphic design strives to explain why design is effective through observable phenomena. This is a relevant field for research investigation.

Frayling (1993) has distinguished three kinds of design research: *research-into-design, research-through-design,* and *research-for-design*. *Research-into-design* is about philosophy, criticism, history, aesthetics or perceptual themes, theoretical perspectives of social, economic,

political, ethical, or cultural issues (Frayling, 1993; Jonas, 2007). One example could be to research the influence of Art Nouveau style in the packaging of beauty products in the 1990s. *Research-through-design* is done by testing materials, technology, and processes. One example is how the Tetra pack industry has developed a sustainable packaging system through research, which considers the entire cycle of a paperboard. According to Jonas (2007) these two forms of research provide knowledge or theory contributions to the design disciplines. *Research-for-design* informs the design process. As mentioned previously, Frayling (1993) has described it as "research where the end product is an artefact" (p. 8). Data collected through this type of research guides the design thinking, decision-making and evaluation throughout the design process. There are three relevant aspects of research-for-design for this study: 1. It can be practised informally through intuition, creativity, and experience or with all the formality of a method that includes the explanation of phenomena, the collection of data and the basing of decisions on the data; 2. The approach to *research-for-design* can utilize a wide variety of methods for the purpose of supporting the design process and decision-making; 3. The supplied information by this type of research is "valid only for a certain period of time, because it is related to reality that design aims to change" (Jonas, 2007, p. 191) (e.g., research on the market, user, product, semantics, or technology). Research-for-design is a common practice in design studio courses, where professors can promote diversity of methods of conducting research to provide students with valuable learning experiences (Armstrong and Stojmirovic, 2011; Frayling, 1993; Kurt, 2009; Lupton, 2011a; Shaughnessy, 2010; Shea, 2012). I define research-for-design as any activity developed with the purpose to understand the problem, the context and the people involved in order to provide an effective response of design.

Research-for-design and design process are interwoven activities feeding each other iteratively in a process of managing knowledge and decision-making (Press and Cooper, 2007). Research practice in graphic design can have an impact on the design process as well as the product. Press and Cooper (2007) have presented three main purposes of research-for-design: One is *the search for understanding*, which includes collecting information about markets, products, stakeholders, manufacturers, suppliers, customers, and users. Two, is *searching for ideas* through diverse techniques of creative generation of ideas. And three is *the search for solutions*, which involve reviewing previous designs, testing the ideas and the required technology, processes, and materials as well as marketing strategies. Based on those purposes Press and Cooper (2007) have developed a model with the aim of exploring and reflecting on the research activity during each step of the process. This model facilitates an understanding of how different research techniques are woven through the whole design process. The model includes four stages "formulation-evolution-transfer and reaction." In these four stages the research-for-design practices are described in detail (see Table 5).

Table 5

The Press and Cooper design process and research cycle

Design process and research cycle		
Stage	**1 Formulation design 'origins'**	**2 Evolution design 'refinements'**
Objectives	Problem investigation markets and technology. Problem definition – idea generation	Idea refinement Concept generation Solution refinement Prototype development Design freeze Design specification
Research	Competitor Market Lifestyle Contextual Trends Anthropology/Ethnography	Practice-centred Technology Participatory Contextual Market

Stage	3 Transfer design 'production'	4 Reaction design 'outcomes'
Objectives	Production, installation Launch Delivery	Evaluation of outcomes against objectives Customer/user appraisal Product success
Research	Practice-centred Technology Market	Contextual Market Trend

Source: Adapted from D. Bennett et al. (1988). 'The design of products and services,' in M. Bruce and R. Cooper

Based on this idea and the model of six stages, I have proposed for this research to explore in more detail the diversity of research activities at Concordia University and UASLP. The following description of this design process model integrates the understanding of the types of research-for-design used in each stage of it (see Table 6).

Table 6

The design process and specific research-for-design activities by the author

The design process and types of research-for-design				
Stage	**Objective**	**Topics**	**Methods**	**Features**
1 Exploration	Understanding	Competitor, market, Lifestyle, contextual, trends Anthropology/ Ethnography	Observation, reviews on relevant facts, walking on the streets, taking photos, chatting with people, brainstorming, mind mapping, interviewing, focus groups, visual research, site research. Participatory	intuitive, informal and formal, explorative, connecting with organization's culture, context and audience's culture and context.
2 Definition	-Information transformation -Requirement generation	Requirements, specifications	Identification, categorization and transformation into significant features or requirements within a creative brief. Participatory	Rational and intuitive, formal, led to criteria.
3 Creation	Idea generation	Search on previous art and design works.	Creative techniques; sketching in an iterative process.	Design thinking, intuitive, informal and individual and collective search.
4 Develop	Idea evolution	Technology, contextual, market	Prototypes, evaluation of ideas, participation of stakeholders and audience; search of technology, materials and processes.	Intuitive but more formal and objective.
5 Implementation	Idea production Launch Delivery	Technology, materials, processes, market	Search on materials, production processes and the transference methods. Participatory	Formal and informal, assessment and supervision.

6 Evaluation	Impact and results	Contextual, market, trends, users' impact	Quantitative and qualitative: measure and evaluation of results and impact.	Formal and informal, deductive and intuitive, subjective and objective.

Six stages design process model and specific research-for-design activities for each stage.

Stage one: Exploration or general analysis of the scenario. The purpose of this stage is to create a general overview of a given design need in a more intuitive way, and set the ground for the next stages. Press and Cooper (2007) explained: "The aim for the designer is to understand intuitively the world for which he/she is designing, to enable the generation of ideas, and to trigger the creative process – searching therefore for understanding and for ideas" (p. 105). The activities involved in this early stage are: to identify the organization's philosophy, ethos, goals, and perspectives to provide a general statement of the problem; to identify the context; to identify the individuals, facts and elements involved; and to develop an action plan (Lupton, 2011b). At the beginning, the designer should focus on the process not in the result or final product. The designer must understand the necessity of information regarding the scenario as well as the research methods for acquiring that information (Lupton, 2011b). Press and Cooper (2007) provided examples of research methods for this stage: online discussions, taking the place of the user, quick ethnography with video, site visits, conversation, and product use. In this study I have contrasted these methods and the ones used by Concordia and UASLP.

Stage 2: Definition or specific analysis of the scenario. The purpose of this stage is to identify, understand, and describe the problem, state the needs in a comprehensive and detailed way. Start with the data analysis of a client's information and designer research. At the end of this stage, the problem should be fully understood and the objectives clarified and shared with the client (Lupton, 2011b). The outcomes of this stage should be: Description of the social, cultural, economic, educational and physical contexts; definition of the audience which includes:

description of demographic features (age, gender, marital status, education, incomes, etc.), and psychographic features (interests, desires, values, goals, etc.); the statement of the problem; and the communication requirements. The analysis can show different causes of the problem and lead to a multiple-solving action in which graphic design is part of those solutions (Press and Cooper, 2007). For this study I have focused on the subject of the design scenario and type of information the curriculum, educators, and student participants derived from data collection practices.

Stage 3: Creation or production of ideas. The purpose of this stage is to create ideas, concepts and solutions. This is a divergent process; the designer produces as many ideas as possible (Stickdorn and Schneider, 2011). The main outcomes of this stage are draft ideas. The activities involved in this stage are the application of creative techniques such as: brainstorming, visual brain dumping, forced connections, action verbs, everything from everywhere; participatory techniques such as collaboration, and co-design (Lupton, 2011a; Lupton, 2011b). Some techniques may be part of the designers' practice or repertoire; others may be the result of research. In this study I have searched for specific connections between techniques of research and the production of ideas, promoted by educators and followed by students.

Stage 4: Development of ideas. This is a convergent process, which means trying to reduce the number of ideas through a process of evaluation and selection for optimal solutions (Stickdorn and Schneider, 2011). The outcomes of this stage are a few selected and developed ideas. The activities involved in this stage are: selection and sometimes mixed ideas; development of selected ideas through an iterative process; focusing on details; incorporation of technology, materials and processes; development of prototypes or mock-ups for assessment and refinement, involving the organization and audience; and the development of specific and complementary elements of design such as production and distribution (Press and Cooper, 2007).

This stage is central to the design process. I have looked for methods and the understanding of the support that research provides to the development of ideas promoted by the curriculum and educators and practiced by students.

Stage 5: Implementation and management for production and distribution processes. The purpose in this stage is to make sure of the quality of the production and to follow up with the launch according to the strategic plan. The activities involved in this stage are: definition of the final features of the project; definition of technology, materials and processes for production and distribution; connecting with technicians in order to do the adequate transference of the design to production platforms; supervision of the production; assessment of the final product; supervision and assessment of distribution or mounting of a campaign. In order to accomplish the goals and deadlines, the correct approach of the production team can be critical (Press and Cooper, 2007). This stage requires looking out of the classroom and involving technicians and stakeholders as opportunity to use informal techniques of research, and that is what I have asked of educators and student participants.

Stage 6: Evaluation of the response to the design product. The purpose is to assess the response of users and stakeholders such as producers, technicians, customers, and suppliers; all of them provide vital information. This stage represents also the opportunity for the designer and the organization to learn about the whole design process and resulting knowledge. The activities involved in this stage are to measure and assess the results or impact on users. There should be noted from the start that by evaluation we are discussing here about the effectiveness of designed objects; even though this may be part of the educator's assessment (Marzano, 2009).

For evaluation one compares the outcomes with the objectives, the staff and audience's appraisal and the impact on the context. Quantitative and qualitative research methods of

assessment and measurement of results can provide lasting feedback following the implementation of design as they were conceived (Press and Cooper, 2007). I was interested in both types of research considered in the curriculum and the educator's perspective as well as the student's actions and how evaluation is actually done at design studio courses.

The diverse research-for-design activities described through this design process model has provided a platform of features, which I have identified during data collection and analysis in this study.

Constructivism and Pragmatism in Design Education

Pedagogical traditions from the Bauhaus, Vkhutemas and Ulm schools are the main sources of design education, informing the preliminary course(s) of study for all art students. These traditions provide "basic training in the properties of colours, forms and materials" (Teaching, 2012, p. 1). Both cases in this study provide this basic training in design studio classes with PBL teaching strategies within a constructivism perspective. This perspective of constructivism can help the instruction of research-for-design in design studio courses, where instructional strategies of design education can be explained by Dewey's theory of learning through experience since he believed this kind of interaction in the classroom as a community sharing experiences and actions, with a common project in mind, enhanced the learning experience (Dewey 1916, p. 75). Again the theory of constructivism is a useful framework in supporting research-for-design instruction and curriculum. Constructivism is a theory that explains how learners know and learn. The fundamental assumption of constructivism is that "people create knowledge from the interaction between their existing knowledge or beliefs and the new ideas or situations they encounter" (Airasian and Walsh, 1997, p. 2).

There are two versions of constructivism; developmental and sociocultural. The former is individualistic in perspective and the latter takes into account the social and cultural milieu in which the individual is situated. The sociocultural perspective is the one that will help us to understand the sociocultural phenomenon that designers need to acknowledge through research-for-design practice, as well as the sociocultural perspective of teachers and students. Lev Vygotsky (1978) built on individual learning and focused on social interaction as underlying activity for learning within the model of constructivism. To Vygotsky (1978) the experience that allows expanding the individual's construction of new knowledge comes in a meaningful way through the interaction with others. Moreover, Bruner (1977) emphasized the notion of learning as an active and social process that is relevant to this study and to the understanding of learning within the design process at the design studio. In this sense Bruner explained how the individual makes sense of experiences and expands his/her schema by selecting, analyzing, transforming, creating hypotheses, and making decisions based on previous constructs (Bruner, 1977; Pritchard and Woollard, 2010). This concept enlightens the relevant role of the instructor, which has been the focus of this research, not only the type of learning experience provided to students, but also of how learning has been promoted through dialogue between students, with the professor and with the social environment.

In addition to constructivism, it is necessary to consider pragmatism philosophy as a way to understand theory and practice of design for this study because "pragmatism emphasizes the primacy of situated practice and the existential condition of being placed in a world of emerging and unfolding phenomena" (Dalsgaard, 2014), since the perspective of this study is to understand the education of research-for-design through the experience and practice of students and educators and their interaction within the context of a design studio. Besides principles of

Deweyan pragmatism, works of Shön (1983), and Buchanan (1995) has relevant influence of pragmatism on design education. Pragmatism explains ways of knowing by interaction with the situation and through an iterative process of enquiry and experimentation that converges with designers' ways of acting and learning as it has been addressed in this study.

Dalsgaard (2014) explains the situation "as an assemblage of subject, context, sociocultural constructs and technologies, pragmatism prompts a systemic understanding of the design situation in which all of these components can influence the design process" (The design process: para 33). Pragmatist concepts have been useful in the understanding of design practice, resources, tools and manipulation of constraints in the revision of all these concepts in the analysis since I have looked into how, where, when, whom, and why students do the instructional methods as well as experiences of research at design studio classes.

Social Constructivist and Problem-Based-Learning

For this proposed comparative study it is necessary to extend the understanding of constructivism found in the learning theories of Vygotsky (1978) and Bruner (1977). They explained how each person internalizes an experience based on their own previous knowledge systems and constructs such as language and culture. Thus, they explained the individual's interaction with more skilled and knowledgeable individuals help him/her to use those systems effectively. Social constructivism states that reality is constructed by agreement and by interaction of the members within their community and with the environment. In addition, learning is a complex, active and social process (Pritchard and Woollard, 2010). That is why this study has searched for how meaningful and effective learning of research is when individuals

engage in social interaction and connect with previous understandings and experiences connecting with context and culture.

This descriptive epistemology provides the model of learning from which some instructional methods can be derived. One of them is Problem Based Learning (PBL). PBL follows specific methodologies according the field of study, e.g., medicine, engineering, management, etc. The instructional method commonly used in design studio courses is hands on Problem Based Learning (Kurt, 2009). PBL is an instructional method in which the instructor provides a real-world problem. It is expected that students develop a solution through individual and collaborative activities following the design process (Kiley, Mullins, Peterson and Rogers, 2000). For PBL in design education, the role of the instructor is limited to that of a facilitator who is responsible for motivation, outlining the project to be developed, to obtain necessary background knowledge in order to provide guiding for the design processes (Olsen, 1999). While students have an active, collaborative and cooperative role in the learning experience (Rojter, 2009).

Summary

This chapter has been set in contemporary contexts with a clear relationship established to writers and theories in the fields of education, art education and design. I have delineated the purpose that graphic design plays, the challenges in design education that need to respond to changes in communication and technology, the development of skills of collaboration and exchange for interdisciplinary work, and the specialization of research-for-design to fulfill social requirements. The design process has been described with a model that facilitates the identification of diverse kinds of research practices that intervene in each of its six stages. Terms

and concepts of the pedagogy of design studio courses and the education of research-for-design has been described. The philosophical frame within a constructivist approach and pragmatist perspective theory that allows understanding of learning processes has been established that will be used to describe phenomena presented by curriculum, educators and student participants in this study. I have described the concepts, facts and issues of research-for-design that I had examined through the six stages of the design process model in the curriculum, used by educators and followed by students at Concordia and UASLP institutions.

The relevance of research-for-design in design curriculum, educator practices, and the impact on student development constitute the body of this research that will be discussed in next chapters within the methodology, the analysis and the results.

Chapter 3 – Research Methodology

This chapter presents the research methodology used in this study; this is a qualitative research of comparative education cases methodology. A descriptive and non-experimental strategy provides a way to explore two graphic design programs at undergraduate level, one in Canada and one in Mexico; and compares them within an international context. As Stake (1994) states, case study is not the methodology selected but rather the subject. The opportunity to study two cases has prevailed because my experiences in both Canada and Mexico. I have explored the cases of study through focused interviews with student participants and educators, taking into account social and educational issues pertinent to both case locations. A comparative perspective has helped to identify the nature of instructors' strategies for teaching research-for-design and students' ways of learning in design studio courses.

The use of available technology, sociopolitical conditions affecting the choice of methods of instruction, instructors' skills, knowledge, and preferred instructional style, accommodation of individual differences among student participants, and accommodation for the geographic location of instructors and their students are all variables within comparative international case studies (Jiaying, 1990). The act of comparison has enhanced the understanding of methods, values, terms, perceptions, attitudes, practices, experiences, and perspectives regarding research-for-design in the two cultural and educational environments.

Comparative Education Research

What is comparative education research? What can this methodology do for design education? Phillips and Schweisfurth (2007) have defined this type of research as: "The study of any aspects of educational phenomena in two or more different national or regional settings in which

attempts are made to draw conclusions from systematic comparisons of the phenomena in question" (p. 24). The main tasks of this international comparative methodology were to collect, classify and display data of educational activity from curriculum, educators and student participants; then inquire with regard to the findings, based on a deep understanding of perspectives, experiences, languages, histories, and culture of the communities that are investigated.

The historical perspective of Bray, Adamson and Mason (2007) situate the beginning of comparative education research in France in earliest 1800. Methods, perspectives and theory have evolved since then to include complex situations with relevant contributions. Examples among many scholars like Bereday, Sadler, Noa and Eckstein, have shown how comparative education has been done from diverse philosophies and from many countries. Altbach and Kelly (1986) asserted that even methods with different research orientations have characterized comparative education research.

Even though there are many relevant issues to consider as Crossley and Jarvis (2000) described:

> the multidisciplinary and applied strengths of the field; "the complexities of this kind of study"; the dangers of the "misapplication of findings"; the importance of the theoretical analysis and methodological rigour; the (often unrealized and misunderstood) policy-oriented potential; and the enduring centrality of the concepts of cultural context and educational transfer for the field as a whole. (p. 261)

These concepts represent just a few of the challenges of this study that manifests the complexity of the experience of the investigator as I have examined the various dimensions of

the phenomena. An optimistic perspective presented by Crossley and Jarvis (2000) sees the field of comparative education case studies as experiencing relevant growth because of the interest in international comparative research, influenced by communications and technology, and the cultural, social, and political dimensions of globalization. As an example of this issue represents the use of computers and devices that are having relevant impact on design education and evolves at a dynamic speed in both contexts.

Bray and Thomas (1995) have emphasized that comparative education can have benefits when a broad focus is taken. They have explained this concept of a broad focus in three dimensions: first, the geographic/locational similar to Mexico and Canada in this study; second, non-locational demographic groups such as student participants and educators in each case of this study; and third, aspects of education and of society similar to the comparison of the curricula that inform graphic design education at Concordia and UASLP.

Interlaced with this comparative study are: education, design and society, the three main areas of this research. On the one hand, traditionally graphic design education has prepared students for commercial careers with an emphasis on product development, advertising and marketing; on the other hand, there are shifts in communities for a potential post-consumer, pro-community, pro-environment ethos with regard to graphic design. Both approaches use research-for-design in similar ways (Press and Cooper, 2007; Frascara, 2008). Comparative education engages the exploration of context and culture because it is more general in scope and can summarize the effects of a variable such as research-for-design in basic terms. Meanwhile the international comparisons illuminate both inter-cultural differences and similarities for theoretical and practical purposes. The international dimension of this kind of research helps one to learn from others and from one's own culture as well, identifying strengths and weaknesses,

paradigms, models, strategies and constraints in teaching and learning. This case relates solely to research-for-design in graphic design education. The limitations I acknowledge in this study with relationship to a comparison of cases are the potential to overgeneralize data, the incompatibility of scenarios for teaching graphic design across the two cultures and the data on student participants represent the situation of each institution.

For these specific purposes comparative studies have helped to deepen learning processes and best practices, trying to understand what has been done in graphic design education with regard to research-for-design. In addition, using an international comparison may help to avoid ethnocentrism and to look outside for multiple possibilities of resources and solutions (Phillips & Schweisfurth, 2007). Exemplary international comparative studies on education are: Teaching Democratic Values in Teacher Education Programs in Canada, Mexico, and the United States conducted by Norma Tarrow, Ratna Ghosh, and Aurora Elizondo (2001). This qualitative study based on interviews with teachers and students identified important values providing an understanding on how these values are shared but expressed in different ways in the context of these countries. Another study has been done to analyze how adolescents, 12 to 15 years old, use Facebook in Colombia and Spain, through in-depth interviews and content analysis. It was a quantitative and qualitative study, about how young people communicate among themselves and the experiences they obtain from Facebook (Almansa, Fonseca and Castillo, 2013). A third comparative case was done by the Institute of Education (IOE) at University of London, led by Tina Isaacs, who undertook a comparative study of instructional systems across six high-performing countries (NCEE, 2015). That study, produced country profiles and a cross case analysis, with the aim to understand commonalities among the high performers to identify aspects of instructional system design, which might contribute to high performance. Though

there are practical and theoretical difficulties in conducting comparative research, it is relevant to consider the possibility to contribute through an international perspective to domestic systems (Creese, 2016).

The concept and aims of comparative and international studies in education have been explained, now the process can be described. Through a comparison of design education systems, this study has searched for student participants and educators' perspectives, descriptive data, development of theoretical frameworks, diverse perspectives of instruction, support for curriculum reforms, co-operation and mutual support within the field of design education.

Interviews

Yin (1989) emphasizes that interviews for case study are one of the most relevant sources of information because they offer a direct approach to the people involved in human education. Interviews explore a wide variety of facts such as experiences, attitudes, feelings, thoughts, even ideas or insights relevant to this study. These facts provided by the participants are not disclosed by other sources, furthermore, interviews are not data collection processes but a process of social interaction between two individuals in which interviewer has a determinant role, leading a dynamic interaction and building through empathy (Corbetta, 2007).

Procedures and Protocols of Research

The type of interview used was a focused interview, which took a short period of time (about an hour), and it was an open-ended in nature taking a conversational form (Sierra, 1998). As the interviewer I have followed a set of questions on specific topics. For the interviews, participants have been apprised of procedures, the extent, time and place of the interview and consent

formalities and SPF (See SPF in Appendix) previously approved by the ethics committee from Concordia University, where participants have chosen to stay anonymous or to reveal their name. Most interviews took place at university facilities such as the library or educators' offices, a few of them were through Skype.

Interview Guide

The interview structure was the same for students and educators, eight main questions that facilitate analysis and comparisons. Questions were designed in three stages: first, building rapport with background and basic definitions; second, exploring the topic of graphic design, graphic design process, design education processes, and research-for-design practices; and third, soliciting reflection, advice or suggestions about improving and innovating research-for-design in graphic design education. These were open questions delivered as a conversation in order to facilitate the flow of ideas. The order of questions was presented with a certain flexibility creating a friendly environment, and offering enough time to reflect for each answer. Student participants' interviews have lasted 50 minutes, and educators interviews lasted 60 minutes; even though time was elastic according student participants' and educators' time. Interviews in Canada were in English, in Mexico they were in Spanish; analysis and coded data remain in language of origin. At the moment of creating tables and the present document, I have translated information in Spanish into English. I have digitally recorded the interviews and transcribed them. The main questions were:

Background and basic definitions:

- Why did you choose graphic design?
- How did you become a designer?

- How do you define graphic design?
- What are the benefits that graphic design provides to society?

Design process and research-for-design:

- Can you describe your design process?
- How does research help you in the design process?
- What kinds of tools of research did you use?

Improving and innovations of research-for-design education:

- How does your teacher promote research?
- What are the benefits of improving students' research skills?
- What can be done to improve students' research skills?
- What are students'/teachers' attitudes towards research?
- How can research learning be improved?
- What is your vision for teaching graphic design in the future?

Selection of Participants

Participants of this study were educators and student participants from the Visual Communication Design stream of the Design program in the Department of Design and Computation Arts at Concordia University; and the program of Graphic Design at the Facultad del Hábitat a la Universidad Autónoma de San Luis Potosí (UASLP), both specifically from the studio design courses. Two balanced groups of students and educators similar in number, academic levels, and background were assembled in order to facilitate comparisons (See Table 7). The number of participant individuals included 12 educators and nine students.

Table 7

Characteristics of student and professor participants from both institutions

Participants' background								
CONCORDIA UNIVERSITY	Students		Professors					
		Level		Underg	Master	PhD	Time	University
	1	G. McDonald Intermediate	1	M. Racine Ind. Design	Communi-cation	Design	Full	U. Montreal
	2	C. Bisaillon Advanced	2	P. Macedo G. Design			Part	Concordia U.
	3	H. Langford Advanced	3	N. Dumond G. Design	Graphic Design	Graphic Design	Full	U. Laval
	4	S. McInnes Alumnus	4	R. Richman Literature	History	Architec-ture	Full	U. McGill
			5	C. Moore G. Design	Communic. Design		Full	Nova Scotia College
			6	T. Carlisi G. Design	Art Education	Fine Arts	Part	Concordia U.
	Students		Professors					
UNIVERSIDAD AUTONOMA DE SAN LUIS POTOSI	1	A.O'Farril Beginner	1	J. Villalon G. Design	Graphic Design		Part	UASLP
	2	M. Perez Intermediate	2	C. Santana G. Design	Visual Arts		Full	UASLP
	3	S. Barrientos Advanced	3	I. Carrillo G. Design	Graphic Design		Full	UASLP
	4	V. Rodriguez Alumnus	4	V. Martinez G. Design	Graphic Design	Cultural Studies	Full	ITESO
	5	E. Pardo Alumnus	5	O. Monjaraz G. Design	Education		Part	UASLP
			6	J. Yanez G. Design	Graphic Design		Part	UASLP

And two alumni which represent a substantial sample of data for qualitative interviews conducted with focus, since the purpose of this investigation did not include generalizations.

Concordia student participants were personally invited, and they were the four who accepted to participate. While UASLP student participants were selected by the program coordinator and all of them accepted. Educators were also personally invited, and all of them accepted. Students have been selected randomly in each group, older than 20 years of age. They were selected in order to represent all levels of the program from beginners, intermediate and advanced levels, and alumni were included in each university.

Full time and part-time educators in both faculties were selected. The full-time educators have provided information on the specific institutional education of class and the tasks for teaching; and the part-time educators have helped to connect with current issues of design practice such as technology, market context, prices, customers' needs, trends, etc. The criteria for choosing educators have been an even gender split, older than 35 years of age, with more than 10 years of teaching experience, knowledge of teaching and learning processes, most teachers had professional design practice.

Data Analysis and Interviews Analysis

Once data was collected, participants' ideas and the information has been organized, categorized and classified. I have followed Hill's (2012) method for analysis of the Consensual Qualitative Research. This methodology is for team research but it has been included in some individual research projects that take into account that teamwork was established to eliminate bias.

Analysis Procedures

1. For this study I have created a domain list based on interview questions, which means eight topics for students and eight for educators. In addition, domains coming from meaningful and unique topic areas emerging from the interviews have complemented the list to code the data. The domain list has changed during the analysis, so data has been reviewed from the beginning again with a new domain list. The domain list was not definitive until all data was collected, reviewed and understood. I have created the same category structure for both cases.

2. For coding interview data into domains, I have taken data from text, in blocks with complete sentences or full meaning but with exact words of the participants and located it in the related domain. The block must be understood by itself, if necessary including the interviewer

question or comments. In this way the block with its designated domain became coded data. The block could be located in two or three domains or even to go to a specified "other domains" if the block didn't fit with any of the established domains. I have numbered the interview data text line by line for easy identification and reference.

3. I have synthesized the coded data into core ideas. The task in this step was to summarize coded data with the essence of student participant and educator participation in fewer words. Hesitancy and redundancies have been removed, and pronouns replaced (e.g. P- participants; I- interviewer). If necessary, I have added any context. It is relevant to notice that the resulted text is a faithful representation of participants' intentions and meanings. In this case it was necessary to keep the interviewer's assumptions and beliefs separate from what the participants were saying. In order to do that, I focused on expressing participants' ideas, as well as reviewing the summaries several times in order to avoid my biases (Creswell, 2011). This process has helped me to ensure participants intentions remain untouched and the core ideas clear, complete and with the correct wording. I have placed the information into tables specifically designed for each question's features.

4. For cross analysis, I have focused on core ideas. I have reviewed core ideas and clustered similar ideas by identifying common elements or themes across the two cases. The purpose was to create a category structure based on obtained clusters. Categories have emerged from organizing, conceptualizing, and clustering into themes. Themes have become the categories and resulted subcategories as well. One core idea could include several single ideas that have been placed into related categories. Once all the data was located into categories, I was able to see the frequency of ideas. Narrative frequency labels have helped to determine how ideas were represented or expressed from the groups of participants and from case to case.

5. Using the category structure for Canada and for Mexico, the idea was not to force one case's categories into the other's case's categories but rather to understand each case structure by itself. This said, the questions for both cases were the same, and therefore answers from both case groups were easy to fit into similar categories. With all this information coming from core ideas, categories and the frequency, I have described and compared the general results to create a comprehensive context of research-for-design instruction. After that I have identified specifically the instruction issues and categorized them within the design process model of this study. The purpose was to identify what kinds of research-for-design was promoted and how they were taught. And then I have compared the two cases. Hill (2012) suggests, for trustworthiness, to describe the whole data analysis process, indicating changes and decisions that emerge throughout the process. Even more, the cross-analysis process "involves a great deal of creative thought, attention to detail, and repetition and revision" (Hill, 2012, p. 133), just in this way, I have avoided some poor core ideas or categories that would not reflect the whole study.

Comparison Process

Through these five steps, comparison started since the beginning. First, I compared student participants with educators of the same case in order to confirm concepts. Then I compared student participants of each case and educators of each program (See Table 8) with the purpose of making a cross reference. And then I conducted a comparison between students and educators of each program. Only results and tables of the third stage of comparisons are presented in this document as resume of the analysis because of the length that it represents.

Table 8

Comparative analysis process between Concordia University and UASLP

Comparative analysis process		
First comparison		
Concordia University		
Students' data	< >	Teachers' data
UASLP		
Students' data	< >	Teachers' data
Second comparison		
Concordia University/ UASLP		
Students' data	< >	Students' data
Teachers' data	< >	Teachers' data
Third comparison		
Concordia University/ UASLP		
Students and teachers' data	< >	Students and teachers' data

Summary

The methodology of this study has been explained through qualitative research found in comparative cases of international design education. The method by which a Canadian and a Mexican graphic design program at undergraduate level have been outlined as well as the way they have been compared within an international context. The features of comparative education research, as well as the issues and the benefits of it have been explained. The criteria for selecting student participants and educators, and the process of the interviews have been

delineated. The method of analysis and comparison that is presented in the next chapter was discussed and compared to identify how research-for-design is currently involved in design education.

Chapter 4 Analysis

Data Analysis

This analysis examines data provided through interviews with students and educators for all those activities related to research-for-design at the Visual Communication Design program of Concordia University, and the Graphic Design Program at Universidad Autónoma de San Luis Potosí (UASLP) based on a comparative methodology.

By research-for-design I am referring to Frayling's (1976) definition: "research where the end product is an artifact" (p. 8) used to inform the design process. Exploring approaches to research used by student participants and promoted by educators at design studio along the design processes. Those approaches that allow problem comprehension, including all sorts of activities understanding the problem presented by the educator and providing information along the design process: data collection, knowing the background of the scenario, displaying and categorizing ideas, reflecting on solutions, the context and users, the searching for solutions, the development and implementation of ideas or interventions, and evaluation of the impact.

Interview Analysis

I have interviewed student and educator participants from both Concordia and UASLP cases. Interviews were planned with the same eight questions for students and educators. I have recorded and transcribed data from interviews. Interviews in Montreal were conducted in English and those in Mexico were in Spanish and I have translated them into English. Data has been coded, categorized and displayed in tables. Tables have been designed for the specific content in each question in order to visualize and facilitate comparative analysis. Analysis is shown next

from question one to question eight: How did you become a graphic designer? What is Graphic Design? What are the benefits of Graphic Design for society? What is your design process? How do you use research in your design process? How do educators promote research? What are the benefits of doing research? How can we improve the teaching of research in design programs? The analysis involved a triangulation between data related to students, educators and curriculum in order to identify and confirm concepts, perspectives, practices, and vision about research-for-design. Each of the eight questions favours diverse aspects of analysis and together have provided a comprehensive approach to the topic.

Canadian and Mexican Backgrounds

How did you become a graphic designer?

This question allowed me to explore the background of participants in both cases and establish the motives of student participants and the professional biographies of educators as they relate to graphic design. I wanted to identify previous education, previous knowledge and ideas about design; as well as previous skills, interests and experiences participants relate to the discipline of graphic design. I have taken into account cultural, educational, technological, and institutional aspects of participants' background. The comparison between students and educators provided a view of educational circumstances they underwent and specific generational situations in each country that may have affected their perception of the discipline as well as their concept; practice and ways to learn and teach research for design.

Background Concordia and UASLP Students

Both groups of student participants from Concordia University and UASLP have shown interests in a wide range of fields outside of graphic design showing knowledge of design possibilities and an awareness of multidisciplinary work. This shared attitude among student participants facilitates the opportunity for them to approach various fields through research to inform graphic design (See Table 9).

Table 9

Venn diagram comparing background of Concordia and UASLP students

Background Concordia / UASLP Students		
Concordia Students		**UASLP Students**
Interests: Computers Art College studies	Interest on Applicability & usability of design Attracted by future possibilities of design Motivated by inclusive perspective of design	Interests: Drawing Design High school studies

Canadian students have conveyed relevant interest related to computers. Concordia students commented how they like computers on a daily basis in their lives. In this sense, Canada shows strength in this field, while in Mexico computers represent at this moment a challenge and limitation for students. The fast growth of technology worldwide and field of web design within graphic design represents a challenge and extra effort for Mexican students that are not as familiar with computers as Canadian students who use this technology with design software since high school and later in college. This fact has an impact on design and research learning because computers are not seen, by UASLP students, as an easy tool for design or research, at least, not in initial and intermediate terms.

UASLP students' previous experiences were basically related to drawing by hand. This skill identifies designers and their ways to develop ideas and solutions. Moreover, Buxton (2007) considers drawing skills as the quintessential design activity. Drawing has been explored as a tool to promote different tasks of research methodology and critical thinking like *mind mapping* for problem definition, and *visual brain dumping*, or *visual diary* for getting ideas for solutions (Lupton, 2011a). Sherwin (2010) has developed what he calls challenges focusing on activities of the design process such as foundation, execution, materiality, instruction, observation, innovation, or interpretation by using rough design sketching. All these activities involve not only a developed visual sense but also critical thinking and engagement that represent actual strength by connecting design with a specific type of research used for idea generation and visualization. In this sense Lupton (2011a) explains that "ideation techniques often involve capturing ideas visually: making sketches, compiling lists, diagramming relationships, and mapping webs of associations" (p. 5) and Roam (2008) states: "all of these modes of enquiry are forms of graphic expression" (p. 5). So, I have identified among these students the connection between visual skills and education of research methods for design producing visual modes of enquiry. For Concordia students, drawing has taken a digital form that needs to be explored in order to understand how it is evolving. Visual skills remain the same but adapted to the digital world. These situations represent two different ways to approach design and as consequence, two different ways to approach research. Research by drawing and research through technology both generate ideas and solutions to graphic design problems. Both are valid but perhaps UASLP student participants will follow Concordia students moving to drawing by computers.

Background Concordia and UASLP Educators

Concordia educators had multidisciplinary education backgrounds, while UASLP educators had mostly mono-disciplinary backgrounds. This fact influences design education, design processes and research activity, with different understanding of contemporary social problems (See Table 10).

Table 10

Venn diagram comparing career background of Concordia and UASLP educators

Background Concordia / UASLP Educators		
Concordia Educators		**UASLP Educators**
BACKGROUND STUDIES 1.Underg. G.D. Master G.D. 2.Underg. G.D. Master G.D. 3.Underg. Photo Master G.D. 4.Underg. Engl. Master History PhD Arch. 5.Underg. Ind. Design. Master Communication PhD History Multidisciplinary/ Inclusive perspective of design Creative/intuitive Fine Arts stream	Professional practice Educational training	**BACKGROUND STUDIES** 1.Underg. G.D. Master G.D. 2.Underg. G.D. Master G.D. 3.Underg. G.D. Master G.D. 4.Underg. G.D. Master Educ. 5.Underg. G.D. Master G.D., PhD, Cultural Studies Mono disciplinary/Exclusive perspective of design Functional/rational Design stream

The multidisciplinary view has been called by Professor Kats (1995), *inclusive*. Concordia's inclusive perspective of design represents an outcome of having an education that involves diversity in areas of knowledge. A Concordia educator explained, "I wouldn't have articulated it quite in the same way I do now, in how architecture and design create an interface, create possibilities for interactions" (Richman, personal communication, September 10, 2013). Moreover, this perspective updates the concept of design in current reflections as Daalsgard (2014) explained that "Design is characterized by emergence and interaction" (para. 7) and that

illustrates the triangulation perspective of this study: Problem posed by educators, solutions, generated by students and co-evolution takes place in the curriculum because the curriculum is designed to promote the evolution of the student but also is the vehicle for educational change as well:

> Throughout the process, the design space—i.e., the arena in which the designer acts—undergoes changes. This ongoing development is influenced by reciprocal interaction between designers, stakeholders and the various components of the design space. As phenomena in the design space interact and evolve, new opportunities and constraints for design emerge (Daalsgard, 2014, para. 7).

A relevant finding was that diversified background of educators of studio design courses not only contribute to the understanding of how research methodologies support the design process, but also facilitate the comprehensive perspective necessary in the development of significant design proposals as well as the understanding of design itself and its evolution.

I found in the case of UASLP educators' background, an opposite term, the *exclusive* perspective of design, since UASLP educators have studied graphic design both in their undergraduate and master's degrees at the same UASLP Faculty. This situation provides a disciplinary approach to graphic design. It is built solely from graphic design studies and educational experiences which express an attitude and practice of design that depends on the design discipline exploring and contributing to it as a closed system, which somehow limits the development of the career, in a moment when interdisciplinary and collaborative work represents the key to solve current complex problems in commercial and social environments. Even though, inclusive or multidisciplinary and exclusive or mono-disciplinary perspective of design in this study shows relevant differences in educator participants' answers. Both concepts, inclusive and

exclusive, provide a complementary understanding of research methodologies for design, going out of the discipline or going inside the discipline.

At this point, I consider it necessary to state the difference between the educative and the professional arenas. I understand that if the arena involves more interactions, more opportunities and constraints emerge. Interactions taking place at university arena struggle to provide relevant educational possibilities and it constraints and limits learning opportunities. Design scenarios presented in university settings are simulations without real parameters. Professional and real world arena experiments emergence and interaction, like solving commercial or social problems, promoting plural interaction of design perspectives (Frascara, 2008; Dalsgaard, 2014). Research serves many roles in design education, including the bridge between university and real world settings.

Graphic Design Definition

What is Graphic Design?

This second question has explored student and educator participants' definitions for graphic design. I wanted to identify the parameters of graphic design as a discipline in both cases for all participants. First, I aimed to discover the purposes of graphic design on a personal level for each participant and to look for shared definitions as well. Ultimately, I want to know what the effects design studio courses may be having on participants' definitions of graphic design; digging deeper into the definition of graphic design. Second, I hoped to explore activities, processes, methods, and strategies about research are promoted in design education. And third, through a brief oral definition one often hears what participant value. The principle as the criteria that motivates their design practice in the classroom emerges. These three aspects: purpose, activities,

and values are the main categories shown in the collected graphic design definitions by Simon (Simon, 2010) as the main concerns among 100 authors.

Graphic Design Definition of Concordia and UASLP Students

The first finding on student participants' definition of graphic design is that both Concordia and UASLP students have identified functionality as the prevalent value (See Table 11). They have explained that functional design involves: reaching audiences, calling attention or connecting, facilitating understanding, encouraging or persuading people, among others, by a suitable design form and effective communication. These ideas show a specific point of view expressed by an old statement: "form follows function" (Sullivan, 1896, p. 408), a principle stating that the shape design gives, should be created based on its intended purpose and function. As well as Gropius (1925) functionalist perspective of design that involves values as function, durability, inexpensive and beautiful.

Table 11

Comparative on graphic design definitions shared by Concordia and UASLP students.

Graphic design definitions shared by Concordia and UASLP students	
Concordia Students	**UASLP Students**
Graphic design is visual communication with a functional intent in mind	Graphic design is visual communication
Graphic design is utilitarian art	Graphic design is functionality
Graphic design encourages people to change habits and culture	Graphic design is persuasion
	Graphic design works for the audience
	Graphic design contributes/supports society
Graphic design facilitates understanding, it is a teaching/learning tool	
Graphic design makes advertisement	
Graphic design makes things beautiful	Graphic design incorporates aesthetics

Even though the statement “form follows function” (Sullivan, 1896, p. 408) has been a matter of endless discussion, what is relevant in students’ expressions, from a pragmatic point of view, is their way of describing design principles that focuses on intentional purposes. Within this context, I infer that curriculum and course outlines facilitate investigation beyond form (Winkler, 2008) that is possible e.g. in social projects that require better understanding of graphic design contributions for change in social, cultural, political, economic, and technological contexts. In this sense, the social arena represents an area in which research can be explored with educational purposes by educators and students. This area offers a wide range of problems and needs that demand creativity and knowledge based on research-for-design.

By the same token, Concordia student participants have explored social applications of graphic design in fields such as education, culture, politics, and arts that have provided memorable experiences of research. While UASLP student participants have explored more commercial projects in which they also have memorable experiences of research. Even though, the practice of research is different. Frascara (2008) explained that advertising in commercial area of design is trying to change small buying habits by showing different images of products, which is not easy, while in social areas of design changing thoughts or habits requires a communicational strategy based on deep understanding of the specific community.

Community-based projects in design studio courses may be a practice that not only provides engaging and challenging problems but deeper and complex possibilities to explore by research-of-design. Drenttel (2012) said in this sense that social design “is a larger activity that depends upon design in all its forms-thought, processes, tools, methodologies, skills, histories, systems-to contribute to the needs of a larger society” (p. 7). Social design is a pragmatic and user-oriented design practice that provides educational experiences strengthening comprehension

of the need and practice of research-for-design to be considered in design studio courses. In this sense the approach to social design takes different forms among the cases of this study.

Concordia and UASLP student participants have described differences between design streams. Canadian students connect design with art, while Mexican students connect design with design itself. Concordia University has situated the Design Program in the Fine Arts Faculty, where art permeates design with its philosophy, aesthetics, history, and research methodologies. Although, Concordia student participants have shown a relevant connection with art, they have also shown clear understanding of functional values of design when it is related to education, advertising, or marketing. The expressed connection to art provides a special viewpoint of aesthetics and gets investigation resources from art research methodologies that involve postmodern philosophy and intuitive practice of research. While the Habitat Faculty of the UASLP, houses the Graphic Design Program where design leads programs with a singular unity. In fact, previous name was The Habitat Unit (Unidad del Habitat). At this faculty, the education model comes from Bauhaus within a modern philosophy and determinist practice of research. Methods of research as well as design responses are determined or conditioned by the kind of project, with similar or identical proposals of students.

These perspectives have different impact on research education by the arts, design or communication fields in curricula and the pedagogic model used for studio design courses. In my experience studying at Concordia University, the way of doing research in the Fine Arts Faculty has provided a wider and creative view of ways of doing research and collecting data from society. What student participants have expressed is that comprehensive and innovative concepts of research methodologies for design can be developed in an open environment with the aim of intervention for change.

Graphic Design Definition of Concordia and UASLP Educators

Educator participants have shared complementary aspects of research to the ones students have commented above. Concordia educators have mentioned concepts related to design such as communication, function, intention, facilitation, and vision. Meanwhile, UASLP educators have described graphic design's final intention as promoting change in people's minds (See Table 12).

Table 12

Comparative of graphic design definitions shared by Concordia and UASLP educators.

Graphic design definitions shared by Concordia and UASLP educators	
Concordia Educators	**UASLP Educators**
Graphic design is visual communication.	Graphic design is visual communication.
Graphic design has a functional intent in mind.	Graphic design is functional and persuasive.
Graphic design is art in one end and functional/information on the other.	
Graphic design is utilitarian art.	
Graphic design is coherent and creative process that enables him/her to put ideas into something tangible.	
	Graphic design works for an audience as a group, community or society, including its culture and context, from which words, images, values, traditions and meanings determine the structure of the message.
Graphic design facilitates transfer information.	Graphic design solves communication problems.
Graphic design creates an experience for people by facilitating information that helps people to have a better life.	Graphic design is responsible for education.
Graphic design facilitates decision-making.	Graphic design sales and disseminates.
Graphic design is a process, an attitude, a vision, an intention on the world.	

According to the latter, these ideas come from Frascara (2008) who has proposed a definition of visual communication design as "the discipline that dedicates itself to the production of visual

communications with the aim to affect knowledge, attitudes and behaviour of people" (p. 19). These concepts integrated along the design processes, facilitate the understanding of research and the relevance of its practice. Both the Canadian and the Mexican cases regarding the definition of graphic design pointed to creative processes based on the need for extended research-for-design addressed in studio design courses focusing on the user. In this sense Noble and Bentley, stated that,

> this recent concentration upon the processes and methods involved in graphic design – a conscious reflection on *how* and *why* of the practice, has allowed the area of research methodologies to take on a greater degree of significance to the subject. (p. 18)

This approach to users in both groups has brought the communication dimension of design. They have emphasized communication as the means to provide society with an integral development and to provide a persuasive voice in the market place. The communicative function of graphic design requires deep reflection about design responsibility and orientation towards community problems and needs that are grounded in research. In this sense Frascara (2008) explained the relevance of research in contemporary social contexts for graphic design, which reflects Concordia and UASLP educators' ideas:

> Certain social problems cannot be solved through simple communications; communication must be conceived based on profound understanding of the community's culture, with intelligence, sensibility, enough financial and institutional support. (Frascara, 2008, p. 58)

Educators' understanding of communication in graphic design, contributes to the need for research education, guiding design processes, searching for suitable data through innovative

methodologies of research with aim of effective immersion, experience, and understanding of the community.

Visual communication defines graphic design as its main function. Concordia educators have agreed about this function of design but they have added aesthetic principles saying: "Design is not only functionality; it is also the aesthetic dimension" (Racine, personal communication, April, 4, 2013). For Concordia educators, beauty is not only a value but a requirement for designers. Paul Rand (1987) explained this as designers' ability to provide effective and aesthetic solutions:

> Graphic design embraces every kind of problem of visual communication, from birth announcements to billboards. (…) What might entitle these items to the "good design" accolade is their practicability and their beauty, both of which are embodied in the idea of quality (p. 65).

What is relevant for this study is how research practice contributes to the design development with the aim of solving a problem with functionality including aesthetic values, by observing, doing, exploring, experimenting and evaluating both aspects of design.

Graphic Design Contributions to Society

What are the Benefits of Graphic Design for Society?

This third question explored student participants and educators' perspectives on graphic design's functions and ways of interacting with society. Data has been organized in categories: *Who is benefited*? The subject of study and application of design strategies. *What are the benefits*? The kinds of impacts or benefits of design's outcomes. *How does design provide the benefits*? The strategies and processes of the design practice when solving problems. And, *where is the area of*

benefit or impact? The areas of intervention such as commercial, social, education, health, or nonprofit organizations or democracy. Here I wanted to know student participants and educators' ideas, examples of applications of design showing their area of interest and vision for design in action. I was looking for participants extended definitions and understanding of what graphic design does in the real world. I was interested in the descriptions of design interaction with society and its connections with research activity.

Graphic Design Impact on Society Concepts of Concordia and UASLP Students

Concordia student participants have described benefits of graphic design applications in areas such as commercial, education, political, social and ecological; as well as supporting science and academics as an interface of visual communication (See Table 13).

Table 13

Comparative of Concordia and UASLP students' concepts of graphic design impact on society

Students' concepts of graphic design impact on society	
Concordia students	**UASLP students**
Graphic design provides a good efficient of the information, by creating information clearer, organizing data, hierarchy information so people can quickly catch the opportune information, making things attractive.	Graphic design facilitates information by making the idea clear and memorable, by decorating, and making things pretty.
Graphic design socially ethical is looking up for the best for people, works for education, gets information out to people for a greater cause. Design connects people to people, products, and ideas.	Graphic design persuades, and convinces, GD influence culture. Graphic design makes conscience and educates, Graphic design creates identity.
Graphic design is huge for selling, adds value to products, and sparks curiosity for advertising.	Graphic design facilitates things in the commercial activity. Graphic design connects product/service provider and consumers.
Graphic design makes educational materials more interesting, it can take knowledge from research to improve and support education.	Graphic design contributes to production, planning, budgeting, marketing, and sales.

A UASLP student participant has mentioned, “graphic design connects people as an interface” (Pardo, personal communication, March 26, 2013). While a Concordia student has stated: “It universally connects people to things, to products, to different ways of thinking, to ideas” (Langford, personal communication, April 24, 2013). According to student participants in both cases, these connections are facilitated by good efficient display of the information by making things accessible and pleasant for people.

Another benefit expressed by Concordia and UASLP student participants was the social impact of graphic design where design products can provide relevant support and influence culture for social change: “graphic design influences society by making culture through logos, brands, images, ads, videos, etc.” (Barrientos, personal communication, March 11, 2013).

A particular and relevant UASLP student participant’s reflection was on how design skills can impact areas out of graphic design such as production, planning, budgeting, marketing, and sales. An alumnus had shared how, in a factory environment, his design skills have solved different kinds of problems through critical thinking and the application of design tools with successful outcomes. Leadership, observation, creativity, managing, communication, visual communication, computers and research skills have helped this designer to be a key player in the innovation of those processes (Pardo, personal communication, March 26, 2013).

Benefits of graphic design have been resumed by a Concordia student participant as she has manifested an ethical concern: “looking out for the best for people” (Langford, personal communication, April 24, 2013). Another Concordia student participant has provided examples of how research is involved in this endeavour “creating material in a way that actually helps people to learn” (McDonald, personal communication, April 24, 2013). UASLP student

participants have expressed similarly how social well-being is a graphic design concern in different data sets.

Social impact of graphic design has been described by student participants as connecting people to people, things, and ideas. These connections develop communities in areas such as economics, culture, education, politics and environment with ethical concern showing clarity of the social role of design setting the ground for the promotion of research-for-design as the practice that provides understanding of social scenarios to be transformed.

Graphic Design Impact on Society Concepts of Concordia and UASLP Educators

Educators have also placed emphasis on the main contribution of design as providing social change (See Table 14). Concordia and UASLP educators have explained that design and society maintain a dynamic relationship that designers need to update constantly. Cross (2001a) explains the way design and society are connected and influence each other as they change.

Table 14

Comparative of Concordia and UASLP educators' concepts of graphic design impact on society

Educators' concepts of graphic design impact on society	
Concordia Educators	**UASLP Educators**
Graphic design orients us in a building; it informs us with a poster, it informs us how to manipulate an object. It provides clarity, beauty, pleasure, structure and assistants.	Graphic design facilitates people's understanding, facilitating information, orientation, and education. Graphic design facilitates communication with order, clarity, and beauty.
Graphic design provides social change and building up communities, society identity. It gives us both the power and the responsibility to communicate with society. Graphic design has ethical responsibility.	Graphic design works for society generating culture, identity and communication. Graphic design can benefit society, because a well-informed society is a more cohesive society.
Graphic design shapes the world in the way we live, design influences our behaviour; it influences our way of being.	Graphic design communications should modify first, knowledge, second, attitudes, and third, behaviour (Frascara).
	Graphic design promotes the economy.

Educators have shown the vision of how social transformation affects design and design affects society. A Concordia educator participant has stated: “design is shaping the world and the way we live, design influences our behaviour; it influences our way of being” (Racine, personal communication, April 14, 2013).

Moreover, a Canadian educator participant has explained design provides social change and builds up communities (Carlisi, personal communication, April 24, 2013). Mexican educators have explained that design generates culture, identity and communication, in educational, social, cultural, economic, democratic, health, and job sectors of society. The complexity of all these areas of work requires adequate, creative, and reliable approaches for investigation in order to understand the specific community’s needs or problems to solve. In this sense Pontis (2011) explained:

> The role of designers seems to have evolved from creators of design artefacts to facilitators of dialogue, collaboration, and understanding. As an example, design skills seem to have become tools to help people make sense of things by mapping complex situations and drawing meaning from data, and thus understanding and making sense of a problem. (p. 66)

Both groups of educators are clear about how designers are facing new situations that demand innovative tools for collecting information. This contribution should always be present in the development of students’ projects and their communication strategies. The understanding of graphic design challenges could guide research implementation in design education. A UASLP educator has explained that design intervention needs to incorporate education and management, as well as a strong research base, getting effective immersion within the

community. She explained that in order to provide effective responses students should use "immersion and skilled observation of environment and society, avoiding ephemeral or inadequate proposals" (Martinez, personal communication, March 18, 2013). These ideas bring up the designer's responsibility to really understand the community. In this matter, Shea's (2012) exploration of immersion helps us to visualize the wide variety of activities or actions that designers perform in order to get effectively into the community. These actions may be formally structured and planned or they can be informal and improvised, but consciously open, collecting data and getting understanding of the problem. Immersion needs to be promoted in design studio courses in a more conscious and consistent way.

These designers' challenges bring to mind ethic and sustainable concerns that Canadian student participants have mentioned above. A Concordia educator has also shown relevant concern about the interaction and influence between designed objects and their audiences: "design gives us both the power and the responsibility to communicate with society" (Richman, personal communication, September 10, 2013). Ethics and sustainability are becoming fundamental issues in graphic design practice, same Richman explained, due to the impact of any piece of design has in society and in the environment, "from the very first moment the designed object is being conceived until after it is discarded" (Richman, personal communication, September 10, 2013). New methods of approaches need to be developed, new ways to communicate, and to interact because many new objects have appeared and continue affecting society. Canadian educator participants have also explained that people read and react to the visual production designers create so they have the obligation to think about the nature of those interactions. Moreover, designers have to think about that in terms of a wider audience that may or may not interact in the way it was intended. Is that message transmitted in an ecologically,

socially, or mentally sustainable fashion? How do designers think about future projections of it? "We have an obligation to think in terms of the life cycle that each piece of design finds itself in its trajectory" (Richman, personal communication, September 10, 2013). These relevant concerns need to be explored in design studio courses with the suitable tools of research. Ethics and sustainability involve a lot of concepts that need to be taken into account by students and promoted by instructors.

Ethics and sustainability work in the commercial applications of graphic design, such as advertising, has not been addressed by any of UASLP educator participants; commercial area of design has not inspired any reflection. Instead, communication processes in contemporary social scenarios have been more consistently referred. Pontis (2011) has explained in this sense that design is evolving from selling a product or service, or creating artifacts, to being involved in the development of a community. This perspective situates designers in the middle of their society, and demands a broad view, and an integral approach to complex environments, complex problems and situations that even require multi and interdisciplinary responses, new ways to see graphic design practice and the role of designers as well (Press and Cooper, 2007) that require more educative opportunities and possibilities to develop suitable research skills and attitudes. Social problems facilitate learning about research methods because of the complexity and challenges that represent engaging scenarios for education.

Design Process

How is your Design Process?

Through this question I have explored how student participants and educators describe the design process, and the diverse activities implemented or considered during the six stages of design as

previously outlined. In the next tables it is possible to identify what participants have expressed within a model of the design process shown in Table 6, which represents a synthesis in six steps of the design process. In Tables 8 and 9 participants' comments have been synthesized and categorized showing participants' descriptions of how research is involved in each stage. I have been reflecting on what participants have mentioned about research-for-design. This analysis has clarified how students learn about design practice and how research is involved in those processes and what educators emphasize regarding design processes and research for design within their educational practice.

Table 15

Six stages of Design Process Model proposed by the author

Communication Design Process
EXPLORATION
DEFINITION
VISUAL RESEARCH
CREATION
IMPLEMENTATION
EVALUATION

This model has given structure to the next tables used to place participants answers for analysis purposes. The model includes six steps (see Table 7) involving activities such as: naming the project, data collection, analysis, problem definition, objectives, planning,

conceptualization, media strategy, visual research, sketches, proposals, final proposal or prototype, implementation, and evaluation.

Design Process Described by Concordia and UASLP Students and Educators

Student participants have described their design processes as followed in design studio courses (See Table 16). The first issue I have confronted while students described the design process was actually how they start a project. The way student participants referred to assignments was significant. UASLP student and educator participants have used the term *theme, subject* or *topic*. These kinds of terms limit the activity to the creation of a specific design piece, like learning how to layout a poster, a book or magazine, whatever the teacher requests. While Concordia student participants have used more frequently the term *project*, which involves a complex response. Concordia educators have used terms such as *the initial idea*, *initial objective*, and *scenario*, these terms integrate the end user of design and context for design when addressed in tandem. These terms suggest an open response or a variety of solutions and strategies, including a sustainable approach of design going further than mere problem-solving. This educational vernacular, particular to the Concordia case facilitates an approach of actual design practice, as Cross (2007) explained: "The 'function' of a product to be designed is not, therefore, a static concept, a 'given' at the start of the design process" (p. 76).

The difference between using the term *project* or *problem* or *need*, or *scenario* will influence the way students approach any project and the way research is involved in the processes. It may be necessary to reflect on how learning experiences are structured as a project-based learning for design. Setting the project up as an idea, purpose, solving a need or request would require students to frame the problem and provide a solution in a more creative way with the support of research.

Table 16

Six stages of Design Process described by Concordia and UASLP students and educators

Description of the Design Process		
Design Process of Concordia / UASLP Students		
Concordia students		**UASLP students**
Project Search about the audience, theme, previous designs. Reflection about the idea behind the design.	**1** **EXPLORATION** **Case** **Data collection**	Theme Search about the topic through posters, looking for images of topic sources, receivers, and context.
How it is perceived what I want to do, based on the audience? What the project is for? Possible solutions. Changing culture and habits.	**2** **DEFINITION** **Analysis** **Problem definition** **Objectives** **Planning**	Basic concepts General and specific Questioning Audience
Research on design resources. Find a concept or direction. Brainstorming more/research other perspectives Methods/People/Objectives. Adapt/organize/ create new ways.	**3** **CREATION** **Visual Research Conceptualization** **Media strategy**	Visual Research Conceptualization
First sketches Second sketches Proposals to the client, feedback Participatory design with stakeholders and experts	**4** **DEVELOP** **First sketches** **Second sketches**	First sketches Second sketches Proposals
Final proposal	**5** **IMPLEMENTATION** **Final proposal**	Final proposal
Evaluation	**6** **EVALUATION**	Evaluation
Design Process of Concordia / UASLP Educators		
Concordia educators		**UASLP educators**
Project / design or artistic I meet the client. Explore previous designs.	**1**	Theme, problem data collection

Idea or objective/ Setting the framework for the process. Thinking on design problems or SCENARIO. Meet the requirements, contacting people, reading	**EXPLORATION** **Naming the case** **Data collection**	on the topic, client interview
To have a dialogue partnering with clients. Where, what, why. Write a brief. Criteria: qualitative & quantitative. Judging/Criticizing. Non-linear process.	**2** **DEFINITION** **Analysis** **Problem definition** **Objectives** **Planning**	Analysis Problem definition Objectives What I want to happen. Planning
Looking at the scenario. Explore all the options: materials, processes, and typefaces. Modelling maquettes	**3** **VISUAL RESEARCH** **Conceptualization**	Visual Research Analysis and Communication idea. The conceptualization. Analysis of Media strategy
.Creative process. Unpredictable stages connecting together below the consciousness. Unspoken and intuitive elements. Creative process building upon your personal history, your knowledge, and your experience. Mock ups, ITERATIONS, testing, reflecting learning, improving ideas, favouring creativity deepening in understanding,selecting by testing and decision-making. Materials, technology, assembly methods, costs, budgets. Selection based on objectives. Working directly with the object.	**4** **CREATION** **Sketches** **and** **proposals**	First sketches Research Second sketches Research Proposals
Final revisions and printing supervision	**5** **IMPLEMENTATION**	Final proposal production instructions
	6 **EVALUATION**	Evaluation

Exploration

Describing the design process in their teaching practice, a UASLP educator has recognized specific features of design research having expressed how personal ways of design emerge: "Everyone organizes the design process according what has been taught and their own way of being" (Carrillo, personal communication, March 11, 2013), so at times design and research takes personalized methods, getting as many ways as there are designer practitioners, Noble and Bestley (2011) said:

> The understanding of the many factors at work that may influence an individual approach to design problem-solving can range from the prosaic and pragmatic to the sophisticated and poetic. This comprehension, born of training, experience, practical skill and personal philosophy, define the designer and their own personal and idiosyncratic methods of working. (p. 10)

This idea explains the variety of design processes that emerge during design education as well as practice and experience in the professional field. UASLP educators have expressed their interest in facilitating the development of students' personal way of doing design, because it helps to empower their abilities and perspectives of design. Concordia educators have described the design process as a non-linear and organic process, a back and forth process from brainstorming and creative exploration, to research and analysis. Iteration was the term used by these instructors explaining design methods for developing proposals from start at draft level with rough ideas, towards the end of those iterations, when ideas become more defined and refined. "The project progresses through iterations following the methodology and applying effort, motivation, curiosity and passion" (Dumond, personal communication, May 10, 2013). These are two complementary ideas where students can develop their strengths, skills and their own perspectives in the construction of individual methods of design with the support of a generalized iterative process of design where research-for-design will also take individualized ways of practicing it considering the one owns strengths and experience.

A second issue considered in the exploration stage of the design process was *Data Collection*. Concordia student participants have manifested consistent enquiry activity when they analyzed previous designs with regard to improvement, how a design is perceived, how the audience would accept it, and how a design would affect the user and context. Meanwhile a

UASLP beginner student commented that research was focused on imagery and on previous designs. An advanced student has mentioned the need to know about the client, users, and context. Most Concordia and UASLP student participants have described data collection as looking at previous designs for visual resources and inspiration. The analysis of previous designs represents for both groups of students a relevant research activity, providing in several instances, the main or even the only way to collect information about the problem.

UASLP educators have included for *Data Collection*, visual culture as a way to promote interest among students. The exploration of people and places, looking for uses of colour, shapes, and words embedded in the world around the students became another way of visual research. This visual exploration is explained by Cross (2007) emphasizing the relevance of objects of design in the "designerly ways of knowing" (p. 25), getting immersed in the material culture obtaining necessary information from the past as the primary source of their thinking, and he explains: "Designers have the ability both to 'read' and 'write' in this culture: they understand what message objects communicate and they create new objects which embody new messages" (p. 26). UASLP Student participants have confirmed this kind of visual research showing understanding of the design process and ways of exploring the problem.

A consideration from this study regarding research-for-design education was raised by an UASLP educator, when he explained: "in our school we research a lot, even at the undergraduate level, it is just that the approach is different, it is less structured from the point of view of investigation itself" (Yanez, personal communication, March 8, 2013). And he continued describing the role of research:

> At this school, our educational strategy starts pushing students to discover by themselves. If they research, know, organize, classify, understand, and get into

> the problem, their ability to provide a solution would improve a lot (…) a strong investigation process supports the decision-making practice building a project (….) Because research is nourished by the student's life experience, concerns, and interests (….) Questioning everything would build critical thinking and the individual's design method. (Yanez, personal communication, March 8, 2013)

The interviews with UASLP educators have provided a reflection on research methodology for design, where a conflict with the term *investigation (investigación)* has emerged. Educators have related the term investigation to formality, structure, and complexity of scientific research that somehow does not match with the design process that relates more with informality, relaxed structure, and simplicity, "Design methodology comes from research methodology, but we have not gone deep enough in research so both processes are somehow apart" (Monjaraz, personal communication, March 14, 2013). Bonsiepe (2007) explains how design is behind other disciplines with respect to "categorical conceptual systems" (p. 27), and how complexity of contemporary problems and influence of university academic culture are claiming the development of research methodology of design. In this matter same Bonsiepe (2007) stated: "We can therefore identify two reasons for the emergence of design research: one linked to professional practice and the other to academic activity. The tension between the two can and does lead to controversies and divergences" (p. 28). UASLP educators have shown misunderstanding of the term *investigation*, and they separate the term from regular data collection for design. Bonsiepe (2007) proposes a valuable initial clue for clarifying the distinction between the research that provides data and reflection for solving problems within the design process and the research that sets design as an object of investigation. This clarification

not only may be helpful to educators and students, but also delineates research-for-design by promoting approaches for exploring and data collecting for design within creative educational strategies. Moreover, it would be helpful to use different terms avoiding that confusion such as data searching, data collection, understanding the problem (*búsqueda de información, acopio de datos, entendimiento del problema*) as these terms express the activity of enquiry without relating to science. Lupton (2011a) states "the concept 'design thinking' commonly refers to the processes of ideation, research, prototyping, and user interaction" (p. 5). Those terms are increasingly in use among designers and academics and the translation to Spanish would be *pensar diseñístico*. Design thinking can be equated with a designer's investigation or research and avoids the conflict with scientific investigation.

Concordia educators have explained that this exploration starts by raising all the questions related to the problem: who, where, what and why. This process is about reflection, deep questioning, and critical thinking. Concordia educators have described a nonlinear process that combines research and creation as is needed, trying to enhance the understanding of the project and creativity. Corroborating this thinking, Cross (2007) remarks on design methodology as:

> An aspect of concern in design methodology and related areas of design research has been the many attempts at proposing systematic models of the design process, and suggestions for methodologies or structured approaches that should lead designers efficiently towards a good solution. However, most design in practice still appears to proceed in a rather *ad hoc* and unsystematic way. Many designers remain wary of systematic procedures that, in general, still have to prove their value in design practice. (p. 109)

Moreover, according to a Concordia educator there is also an individual dimension that impacts the design process: "there is so much that is unspoken and intuitive. This is building upon your personal history, your knowledge, and your experience from doing other design projects that you bring forward to that process, but it is not explicit" (Moore, personal communication, June 20, 2013).

These shared practices and thoughts about data collection show an advanced model that approaches kinds of "designerly ways of knowing" (Cross, 2007, p. 25) as well as sustainable perspectives. Those are relevant ideas that help modern educational strategies in practices that may be evaluated in design studio courses. Malouf (2011) explains: "learning in the studio is not accomplished through pedagogical demonstrations, but is rather achieved through student observation and enquiry" (p. 101). This is what educator participants have described as diverse practices of enquiry.

Problem Definition

Problem definition is a reflective moment of the design process defined by Shön (1983) as: "the process in which, interactively, we name the things to which we will attend and frame the context in which we will attend to them" (p. 102). Concordia student participants have explained that problem definition is developed by basic questioning. According to them, this process of enquiry involves history review: What has been done before? How to improve it? What would be an innovative solution? It also involves context and social enquiry: Why? Why does this happen? Who am I to look for this? Why are they looking for this? Cross (2001a) explained that "designing involves 'finding' appropriate problems, as well as 'solving' them, and includes substantial activity in problems structuring and formulating, rather than merely accepting the 'problem as given'" (p. 81). A consistent and deep way of questioning the scenario shows

analysis as a regular and intense research practices Concordia students have described. In essence they are providing suitable understanding of the problem through examination and self-reflection. Questioning in the design studio courses represents a critical method for the design process.

UASLP student participants have explained that in this stage of the process, the analysis of collected data allows one to set general and particular objectives as well as the student's own position regarding the problem, but at the same time they start looking for solutions. These expressed ideas show a solution-focused style since analysis of data collection facilitates the construction of problem definition in parallel to the development of the solution. Early studies in this field confirm students' ways to approach problems: Cross (2007) has explained that:

> The designer subjects jumped to ideas for solutions (or partial solutions) before they had fully formulated the problem. This is a reflection of the fact that designers are solution-led, not problem-led; for designers, it is the evaluation of the solution that is important, not the analysis of the problem. (p. 100)

A UASLP student participant has described how he starts with ideas and solutions as a way to explore the problem. MacCormac (1976) has expressed, "I don't think you can design anything just by absorbing information and then hoping to synthesize it into a solution. What you need to know about the problem only becomes apparent as you're trying to solve it" (p. 52). These actions represent reflection and all kinds of mental activities connecting findings within the solution, going directly to the creative stage. Studies of designing by Cross (2007) show that "designers adopt a problem-solving strategy based on generating and testing potential solutions" (p. 36). This is a different way to approach a problem than scientists, because design problems

are mainly ill-defined, that is, non-clear goals, not complete information, initial confusing conditions, or paradigmatic situations (Thomas and Carroll, 1979).

Student participants from both cases have explained that fundamental outcome of designers' research and analysis of problem definition process is *conceptualization* or the formulation of the central idea of the proposal. UASLP student participants have defined conceptualization as a result of critical thinking and synthesis of data analysis. They have explained that visual research outcomes guide decision-making throughout the creative stage involving rational and intuitive processes. On the other hand, Concordia student participants have described problem definition that also involves research as interdisciplinary work with stakeholders, and the iterative back and forth process. These descriptions just confirm the concept provided by Cross (2011) that "education is not only about the development of knowledge but also about developing ways of thinking and acting" (p. 140), that allows understanding the role and ways of research during the creation process of design. Adequate conceptualization based on data collected represents the connection between research and the response of designers.

With this said, Concordia and UASLP educators have commented that there is a gap between all of what has been found during research and the applied concepts in the creative stage. This idea is relevant in the educative process because it is critical for the students to connect research and the understanding of the problem with the response of the solutions. Shaughnessy (2010) explained that "designers need to weld research (reading, visiting, touching, tasting) to creative intuition. Research and creativity should go hand in hand" (p. 31). Trying to find a way to connect research with the creative process Shaughnessy (2010) stated: "Design in its purest sense is research mixed with imagination. Both are useful, but best, when combined

and next to useless when divorced from each other" (p. 32). Educators need to develop the appropriate educational strategy of exploring and understanding the problem and connecting creatively with effective concepts within students' responses or solutions.

Creation

Student participants have explained the creation stage based on visual research as a facilitator of solution development. Concordia and UASLP students described visual research as observing and analyzing previous designs about the topic. Analyzing typography, colour, technique, word expressions, concepts, preferences, trends and even how the theme has evolved as a way to understand the topic. In this sense Cross (2007) explains that "much of everyday design work entails the use of precedents or previous exemplars – not because of laziness by the designer but because the exemplars actually contain knowledge of what the product should be" (p. 125). UASLP student participants have stated that the main way to explore the design situation is by observing. Oxman (2001) explains this common design practice, "in addition to other modes of reasoning in design, an important subclass of reasoning processes, which are most relevant to reasoning in visual-perceptual process in design, is *visual reasoning with mental images and visual representations"* (p. 277). UASLP student participants have confirmed that visual exploration of designers represents visual reasoning practice in the construction of the understanding of the problem and the creation of solutions in mental images that has a relevant impact in the designers' research way of practice that may be considered by educators in design studio courses when guiding visual methods of enquiry.

Stage of Development of Ideas

Development has been mentioned by UASLP student participants as sketching, at this point starts the concrete aspect of the creative stage, sometimes defined as the creative process.

UASLP student participants have consistently expressed the iterative process of sketching and assessment. The process involves sketches, drawings and mock-ups allowing reflection and development of the problem and the solution. Cross (2007) explains "design ability is therefore founded in the resolution of ill-defined problems by adopting a solution-focusing strategy and productive or appositional styles of thinking" (p. 37). *The appositional style of thinking* is defined by Prier (1976): as "a form of expression that states a particular idea and continually elaborates this with details or repetitions of the idea itself" (p. 12). Cross (2011) has emphasized that this style of thinking and working by "modelling, testing and modifying is the central, iterative activity of the design process" (p. 34). Iterative process of creation is based on research-for-design by evaluating and decision-making in the refinement of proposals.

A UASLP educator has explained that the deeper the research, the more students observe, the better is the understanding of the problem, and coherent the concept and the direction of design (Yanez, personal communication, March 8, 2013). Research provides the argument to support the design proposal. The main way to explore the situation is through the sight, observing. Oxman (2001) explained this common design practice: "In our work on visual reasoning, the interaction with the visual representation in a conceptual –perceptual process is one of the phenomena which underlies *visual design reasoning"* (p. 277).

Concordia educators have described the creative stage of the process including sketching, revision, refining, and use of mock-ups, selecting and arriving at the final proposal in a nonlinear process, where the design process involves parallel activities of creating and researching. This description matches with *problems framing* in Cross' solution generation descriptors. It also shows among students, *co-evolution* schemes (Dalsgaard, 2014) as the problem and solution evolve in parallel.

Implementation and Evaluation

Most UASLP student participants and educators have ended the design process with a final choice of sketches bringing those images to the computer. The stage five and six of the design process in our model, implementation and evaluation were not mentioned. The implementation stage of the design process is a relevant moment taking decisions about materials and technology processes. This is notable issue because implementation is a critical part of the process that involves teamwork and collaboration with production companies and stakeholders leading to the end user with ethical and sustainable considerations having a relevant opportunity for research-for-design to intervene in these areas.

In the same way evaluation has hardly been mentioned by participants, when mentioned it was related to academic evaluation or grading the students' work which is not the type of evaluation that stage 6 is about. Evaluation is done in later stages of the design processes, measuring the impact of the designed object on the user and on the environment, and how the goals were accomplished. Fontana (2008) explained that

> this is an issue that is not given much attention. It is as if they understood that the design function concludes with the conceptual strategy or graphic piece. Knowledge of message impact to the recipient can modify the designer´s behaviour, expanding her/his concept of the design process and the competencies of the profession beyond the project. (p. 219)

This type of evaluation helps students in the understanding of accomplishments of the educative process (Gardner, 1993). Evaluation tools used in design studio courses should assess

the impact of the designed object on the user and on the context through suitable instruments of research-for-design.

At this point, student and educator participants have described their design processes. The main features they have expressed were the way the educative projects are called, the personalized ways of doing design, immersion as a way to explore people and places, and the way the term investigation is misunderstood.

Research in the Design Process

How do you use research in your design process?

In this question I have explored participants' ideas of research throughout the design process. I wanted them to describe types of approaches, and data collection, and information searching as a way to understand the scenario as well as the way to inform all stages of the design process. I wanted to know concepts and types of information designers look for; methods and techniques of enquiry; moments when participants do research in the design process; purposes of research in design practice; and how subjects or stakeholders are involved in research.

Table 17 shows organized and synthesized data for comparison purposes in six categories: Kinds of data, methods or techniques of research, time when research is done, purposes, subjects involved, and benefits.

Table 17

Research practice in the design process of Concordia and UASLP students and educators

Research practice in the design process of Concordia and UASLP students

	Concordia Students	UASLP Students
Kinds of data	Images, articles, previous designs. Basic research on clients, organization and audience. The whole life cycle for sustainability.	Topic, case, references, preview designs, context, background, people, reality, images.
Ways of doing research	Looking on the line, reading books, observing culture, speaking with teachers and experts, visiting museums, walking on the street.	Reading, the Internet, books, personal approach, suppliers, stores, and distributors. Through a process, steps, or methodology. Includes polls, surveys, interviews, field research, and focus groups.
When research is done	Before start drawing, and for technical issues.	First stage/Data collection. Last stage /Evaluation of proposals
Purposes	To avoid subjectivity or assumptions. To evaluate other work and then build on top of that. To understand technical processes and material issues. To be responsible for the ecological impact. Improves communication, helps to understand the audience.	Image creation, Problem understanding, identify changes, problems, needs, and deficiencies. To know people better and what they like. To make sure about functionality of the proposal. Benchmarking, new forms, competence, licenses.
Benefits	You learn the best way to do things. Time to reflect on the idea before start drawing. It is rewarding, helps to ground and concrete ideas on specific direction. It helps find the direction, it helps to save time, it helps with your credibility, and it keeps you up to date. It helps you to sell, show you are taking it seriously. It supports innovative proposals with your client. Helps to make it understandable and topics related. Helps to understand people.	Sensitization, motivation, better data collection, needs understanding, graphic design role understanding, and better response. Connects with reality, with what is happening, and with what it is about. Connects with meanings. Avoids repeating, ensures sales.

Research practice in the design process of Concordia and UASLP educators

	Concordia educators	UASLP educators
Kinds of data	About users and their needs, topic, competitors, similar projects, history. About technology, existing solutions, advantages, conveniences, price, materials, processes, requirements, material concerns, what is out there or ways of doing it. About local issues, visual language, context, environmental impact.	About audience or receiver, topics, client project, product/ service, case, background, context, current situation, images. About theoretical, historical and conceptual frames.
Ways of doing research	Asking questions, interviewing professionals of design, talking to people who know beyond design. Sometimes it is just purely kind of impulse. Informal, not documented. Pragmatic research like looking at books, magazines, visual research, gathering images, similar projects, galleries, films, installations. Context approach. Being curious about what is going on in the world, not limited to graphic design, open to all sorts of things, reading the newspaper, world and contemporary issues. Within a back and forth process. With a general way to do research. Writing down about the scenario, keeping all the aspects together, looking how everything connects. Through collaboration incorporating sociologists, ethnographers, historians, philosophers, and anthropologists. To incorporate sustainability within design practice is necessary to research, collaborate, and understand social, cultural, religious, economic, and political contexts in a more comprehensive way. For assessment: reviews, comments, blogs, and critical response by words.	Documents, the Internet, books. Contact, field research, case study, image study. Everyday processes, questioning all the time, observation, interviews, conceptual maps, and books. Systems and processes, registration, question design. The usual scheme is data collection, presentation, and background. More quantitative data through surveys and polls. Making the right questions, the more questions the better. Classifying data. Developing personal strategies and criteria.

When research is done	A prerequisite before you start. If you don't have enough data, you go back and do a better research at any time. Research on the impact of design is hard to quantify.	First stage/data collection, Second stage/ problem solving, Third stage/ searching images, Forth stage/ materials and processes, time cost and quality. Fifth stage/evaluation.
Purpose	How can we improve things? How it can be done better and better. How it can be done with the least way of damaging the environment, sustainable with current resources. Understanding the social, cultural and environmental impact of design. Being aware of the scenario. Designers have a contribution to make. We have a really important, broader, exciting and responsible role. Educating about what we do. To come up with an idea based on your knowledge in contemporary society. If we are going to speak in a language of popular culture, we have to understand what is on the minds of the public at large. Guiding on the direction you are going to take.	To generate ideas and concepts, to understand the problem, to understand how people know and perceive. To solve a design problem, to satisfy client expectations. To set the ground of the design proposal. Understanding all dimensions of the project, and client expectations. Identify possible solutions.
Benefits	Benefits from previous experiences. Collaboration encourages us into participating in a broad vision of being sustainable, holistic and integrative with the aim of broader practices. To put all the emphasis on the environmental impact of design. I learn from specialists and they learn from me.	Generate ideas, Sensitization, updates on the processes of design, research, materials, and reproduction. Provide information for decision-making. Practice and experience for research skills. Approach to reality, professional, independent, and critical formation of designers.

Kinds of Data

Concordia student participants have listed the required information for a design project such as: client and his/her purposes, audience and its culture, previous designs, related images, documents and sustainable facts that showed their understanding of the facts involved in the design practices. Fontana (2008) explained information is the main product of design, "Whatever happens it is up to your ethical conscience as an observer: culture, science, technology, economics, sports and documenting everything from everyday reality" (p. 215). It is necessary to inculcate students with a concern for a comprehensive view of context involving social, cultural, and sustainable parameters for design. It is exemplary first, to be conscious of the complexity of social problems and the need to get information from all different dimensions of the scenario; second, the critical thinking skills needed by designers in order to understand the multidimensional complexity of contemporary social problems. Triggs (2011) explained that:

> Design thinking and critical thinking practice should form the basis of how we approach contemporary social and economic challenges. These skills inform

> how we identify and act upon situations where design can improve the well-being of a community, and provide solutions to economic, ecological and cultural sustainability locally and globally. (p. 125)

In this sense, UASLP student participants have shown an evolving perspective of research practice along their studies, from basic visual research in initial terms to a complex and comprehensive data collection involving different techniques to explore and getting data at advanced levels. Fontana (2008) explains how social and cultural contexts evolve, "so the accumulation of experience is not enough in this profession, unless translated into agility to interpret the diversity, mobility and transformation of the problems before us" (p. 214). A UASLP student participant has described this agility in terms of creativity, innovation, functionalism, and time savers as well as being economical. These features of research, set as criteria in studio design courses, may facilitate the learning process of research-for-design because those features provide accessibility, engagement, and value to students.

Commercial areas of design have been also considered a conducive field of research by educator participants. In this sense, Concordia educators have mentioned specific subjects of research such as existing solutions, advantages, conveniences, price, technologies, materials and processes. While UASLP educators have described specific commercial topics such as: client, technology and markets.

In both social and commercial areas, the user was poorly mentioned. In this sense Meurer (2008) explained that if we see design as an "active intervention and creative change," design won't focus on the object but on the process of interaction and change, design won't focus on the object as form, and he stated:

> Conversely, designers will care about the development and modelling of processes: processes of interaction and exchange, in which objects nevertheless play a central role as undisputed means for action. Seen this way, the design is related to the entire spectrum of physical and intellectual human interaction; the interaction between people, products and the world lived; and the interaction between products. (p. 221)

That means that designer´s interest should involve more the users and their socio-cultural milieu. Change towards an inclusive perspective of users may need a full revision of curriculum and instructional strategies in studio design courses; but it also represents an important opportunity to review the objectives of the career and professional practice as well as diversification of design applications. Examples of these ideas are shown in Design as Experience by Mike Press and Rachael Cooper (2007).

So, in order to place users in the centre of the design curriculum, communication becomes a critical component of graphic design as expressed by Concordia educators. The Concordia Design Program as well as ICOGRADA has recently changed the name of Graphic Design to Visual Communication Design, focusing on the correlation between designer, design product, client and end user. That change alone enhances the role of communication in graphic design. When education of design started with the Beaux Arts and the Bauhaus, neither school had considered design as an essential communication support, liable to contexts of individual and social behaviour (Winkler, 2008), that is why is necessary to look for innovative models of education with an emphasis on users and communication.

What is relevant for this study is the relation between communication and research. Educator participants from both cases have explained that research provides the guide to students

in the formulation of effective communication strategies. Winkler (2008) explains what should be explored to ensure effective communication: “Communication requires knowledge not only of perception and visual discrimination but also of the overall ecological assessment of the discrimination of values, identity, territory, status, and any other dimension that affects or alters the personal and social human behaviour” (p. 244). In this sense changes in the curriculum of graphic design as the ones done for communication are needed in the field of research-for-design.

Ways of Doing Research

Concordia student participants have described informal methods of investigation, which relate to designerly ways of research (Cross, 2007). Meanwhile UASLP student participants have mentioned basic and formal methods of research showing interest and excitement about the results. These two ways of research are influenced by the stream of the program and the philosophical posture of the faculty. A Concordia educator has emphasized the value of informal visual research: “Research is also looking around; you need to just been aware of your environment, to just look around and been conscious of where you live” (Macedo, personal communication, May 14, 2013), from this perspective, informal observation is an attitude, a way to get immersed and participate in daily life, to experience and to take note of one’s environment both visually and socially that enhances students research skills. Concordia educators have also included research practice in a wide variety of informal ways such as reactive impulse, undocumented observation, and pragmatic research by asking questions, interviewing design professionals, and talking to people outside the field of design. Informal ways of research as described may be the most relevant in design education as dynamic and creative ways to collect

data, as an approach to the real world. In a more involved and developed sense Frascara (2008) has emphasized the skills of the researcher:

> The researcher is the main instrument in the collection of information in ethnographic research. The skills required to include knowledge of an anthropological theory of culture, the capacity for empathy, refined perception of cultural and social quibbling, and the ability to discriminate between common situations of idiosyncratic behaviour and conduct, as well as the ability to take notes, organize and condense them into a coherent analysis. (p. 111)

Informal ways of research open up valuable possibilities to broaden the scope of research. Concordia educators have explained the importance of involving stakeholders through collaboration as a critical role in this practice of research-for-design. The idea of collaboration transforms the process of design from an individualistic, isolated practice to a team-oriented, community-oriented and interdisciplinary array of design processes, with a perspective on broadening the capacity for intervention by people outside of the discipline as well as the intervention of design in other sectors of the industry.

Those abilities represent advanced research skills that should be developed throughout the whole graphic design process and taught from the beginning stages of the career program (Winkler, 2008).

When Research is Done?

UASLP and Concordia student participants have described the use of research at the beginning of the process, because it is essential to know about the topic in order to start designing. But other relevant moments that UASLP student participants have mentioned were at the creation

stage. Designers search for imagery with the purpose not only to look for possible images, or avoiding what has already done, but for exploring the problem and how it has been approached before. These are the two moments in the design process that students access research to inform decision-making. Most UASLP educators have also located the main data collection and research at the beginning of the design process. Similarly, some Concordia educators have established research as a prerequisite before the creative process. Both groups of educators connect the research activity, commonly called design thinking, to the first stage of design. Some educators separate research activity from the rest of the creative process, and they don't see any application of research-for-design in the rest of the stages of the design process. Others have emphasized a back and forth approach to the use of research and the creative activity. In this manner, these educators explain how research is continuously used through the iterative design process as many times as it is needed along the trajectory of the project.

Purpose of Research

Research has been fully described by UASLP student participants as primary support for decision-making. It establishes connections between the designer, the problem to be solved and the end user. This is facilitated by the use of data from diverse sources, connecting with social and cultural contexts. UASLP student participants see the purpose of research as getting relevant information for better designed results, searching for the best media solutions and supporting final decision-making. Gathering all these responses, I see how the UASLP students' approach integrates comprehensive data from the user and user's context as a critical component of design planning, as Davis (2011) explained, "Today's environment, however, challenges us to think about the context of design in a more involved, intricate manner. Users are entire ecology of people – not simply consumers seeking goods or deploying functions" (p. 72). These students

have shown a substantive approach to research by getting involved with the complex environment of users, which represents the most important application of data for design.

Some other purposes have been expressed by Concordia student participants like analyzing previous works and then building on top of that, understanding technical processes and materials issues, being responsible for the ecological impact of design, improving communication, and understanding the audience. “In our profession it is necessary to shed formal defaults. You get the form of the message as a natural consequence of investigation, as the conclusion of various analyzes” (Fontana, 2008, p. 215). For these student participants, research leads to an understanding of the complexities of user communities and requires them to interface with the project scenario through the adequate analysis of data.

Concordia educators have focused on design impact and sustainability besides collecting data from stakeholders and the design context. Sustainability is a main concern for many Concordia educators: “Designers need a wide vision of what it means to be sustainable and integrative with the aim of broader practices, learning from specialists in other fields and specialists learning from graphic designers” (Racine, personal communication, April 4, 2013). The Rio Declaration on Environment and Development in 1992 has provided a clear example of how specialists such as environmentalists can provide guiding principles for graphic designers in Principle 3: “The right to development must be fulfilled so as to equitably meet developmental and environmental needs of present and future generations” (UN, 1992, p. 1). So, sustainable development seeks to link ecological balance with social equality and economic development. Designers glean from this statement that in order to be *sustainable* designs should include these three components; otherwise they would be just *ecological*. As Principle 4 of the same document states: “In order to achieve sustainable development, environmental protection shall constitute an

integral part of the development process and cannot be considered in isolation from it" (para. 10). Meurer (2008) provides a way to face this complex concept that involves ecological and cultural aspects as well as spatial and temporal dimensions:

> The sustainable development-oriented design is a complex activity that transcends the typical images of the professions. One cannot conceive nor be taught as a separate field. Existing disciplines and individual areas should work intersected in the field of projects and flexible groups formed specifically adapted to the problem at hand. (p. 232)

Sustainability is a concept promoted at Concordia, by most educators. The discussion surrounding previous questions has shed light on the fact that designers have a responsibility to provide leadership in all kinds of professional contexts. This leadership through design impacts all that is social, economic, political and ecological. That is why the role of designers may be critical in the future of Canada and Mexico. UASLP educators can strengthen the practice of design by collaborative and interdisciplinary practice of research-for-design with a view of sustainable design at the centre of the expanding role of graphic designers.

The Subject Matter

In this category Concordia and UASLP student participants have described the subject as the client, and their role as designers is to bring the client up to date with regard to users, and users' contexts. In this sense Margolin (1995) expressed: "In short, the graphic designer must understand people and their cultural milieu" (p. 105). While Malouf (2011) has set people as number one in his list of principles for design education:

> Understanding people: The designer must understand several aspects of humanity: Psychology: How people perceive, process and act upon the world

> around them. Economics: how people engender value and the process they create for trading value. Anthropology: how people create meaning through structure, language and human relationships. Politics: how people manage and control the relationships in their lives as they relate to perceived power, and how constructs are understood. (p. 99)

It is critical to promote and improve the designers' approach to users and the context of the scenario. Creative and innovative methods of research will facilitate and motivate students' interest and understanding not only about demographic features of user/audience, but also cultural, personal, human features of people.

For UASLP educators the main subjects are clients as well as other designers, colleagues, researchers, and professors. For Concordia educators, subjects are stakeholders, people with special knowledge such as specialists, sales men, producers, suppliers, as well as researchers like sociologists, psychologists, ethnographers, historians, philosophers, anthropologists, and professors. The interaction through research of student designers with this community of people represents as Vygotsky (1978) explains with social constructivism, the suitable environment for learning and development that provides approaches to the real world and comprehensive perspective of a complex scenario to intervene. There is a clear view of interdisciplinary and multidisciplinary ways of working that needs to be developed in order to enrich design perspective. And from within the graphic design profession, designers need to keep responding to complex contemporary contexts. The outcome may be that the community at large can understand contributions of visual communication because of a widened and ongoing dialogue between the design community, other professions and fields of enquiry and the user constituencies they serve.

Benefits

Concordia student participants have commented that research is the best way to do design; helping to ground ideas with regard to a specific direction. They said research rewards by helping to understand people, saving time, keeping you updated, helping you to sell, and supporting innovative proposals with your client by making you more credible. UASLP student participants have explained research makes design not only a more interesting practice, but also a creative and innovative endeavour. These ideas expressed by UASLP and Concordia student participants represent points at which research practice can transform design into a more exciting, challenging and integrative activity. Students as well as educators have an active role in promoting research. Fontana (2008) said about this matter: "The students by themselves must learn to connect knowledge with their experiences. They must establish by themselves the points of coincidence between their project and the reality" (p. 218). Students' concepts and visions for design and research should inform education methods by incorporating students' experiences and interests with exercises connecting with real contexts.

UASLP educators have described positive effects of research practices on students' performance by empowering and developing skills like discussing, interviewing, dialoguing, questioning, and becoming open and flexible, independent and creative, as well as more critical. Hernandez (1997) explains that "learning is a social, communicative, and discursive process in which dialogue constitutes critical fact in the construction of meanings" (p. 282). Concordia educators have described different kinds of benefits of research practice such as learning from previous experiences, promoting collaboration, encouraging students to participate in a broad comprehensive, integrative vision of sustainability's role in design. Davis (2011) explained in

this matter: “The challenge for contemporary design programs is to set aside longstanding assumptions about how design should be taught and to transform both the content and structure of education to meet the demands of contemporary communication” (p. 73). So, research represents the activity which guides design pedagogical strategies to develop the skills, attitudes and perceptions of future professional designers.

So, at the end of this question participants have described the way research is involved in the design process. All students have situated research at the beginning of the process, and they have not identified research at other stages. They looked for previous designs, visual culture, source materials, users, context, and stakeholders. Where the difference lay was in the presence of sustainability in the responses from Concordia student participants. Another relevant difference emerged between the UASLP participants’ formal way of doing research, and Concordia participants’ having described informal, fun, and easy ways to explore and collect data.

Differences between educators in the two cases were the academic and theoretical issues which concerned UASLP educators, while Concordia instructors were concerned about functional issues including environment, sustainability, stakeholders and collaboration.

How to Improve the Education of Research for Design

How do Professors Promote Research?

In this question I have explored teaching and learning strategies and techniques professors use to promote research in design studio courses. These classes are called *studio*, *atelier* or *taller* where one or more educators set the project criteria and act as guides in the development of students’ work. In this study I have looked for methods and techniques in the application of

research-for-design that instructors have facilitated either individually or collectively. I was also interested in institutional facts such as the curriculum, courses, and general faculty practices that may affect the learning outcomes of research-for-design. I wanted to know the impact of research on student participants' performance according to educators' perspectives; educators' attitudes towards research, and how they motivate students to do research. So these were the concepts I have focused on for this comparative analysis shown in Table 18. Student participants have provided a general overview of what has been done in studio design courses. These findings may be corroborated by what educators have described with more detail. Design studio courses are the educational context for both institutions which involves Problem-Based-Learning. Design studio courses are learners centred. This environment fosters student independence and develops skills such as decision-making, critical thinking, and creative problem-solving. Moreover, this style of class is individualized, interactive, and active, allowing dialogue one to one, professor and student, student to student and within the class group.

Table 18

Concordia and UASLP students and educators' description of how research is promoted

Ways to promote research		
Concordia and UASLP students		
	Concordia Student	**UASLP Student**
Methods	Professors have different ways to teach. All professors ask for process folder. Research is part of the homework. Professors work collaboratively in this aspect.	Professors provide a methodology to adapt to your style and to the project, as well as orientation, information and terms definition. Professors ask analysis of data collection before designing.
Techniques	Professors take us to the Canadian Museum of Architecture and to the library; and we were asked to write an essay about it.	Professors guide students through the design process and insist on the research activity. They provide books and invite us to go to the library. At Design studio courses 30 to 50% of time for project is dedicated to research.
Impact	Research helps to support our proposal, not just because it is beautiful or you feel that you should do this or that; it is because you have a reason to do it. The main research activity is on images. Too many of my classmates had their idea before they do	Professors provide liberty for decision-making, they provide methodology to follow, and they demand a design concept based on data collection.

	the research, so they only look in the research for supporting that idea. I do research because I think it is important to do it. To have time to think about the idea before you start trying to draw something to having something down on paper is fairly rewarding. Through research my ideas become more concrete.	
Attitude	Research is a kind of unspoken expectation. The more research you do, the more support you get from professors. Some professors want to see the research results but not how it was done. I don't think research is as encouraged or seen as beneficial by professors. There is not much that professors teach you about how to research. But every professor is different. Feedback is given on what students present rather than how we got there.	Professors provide freedom but at the same time are strict about the methodology. They allow us to develop our own methods of research and methods of design.
Motivation	Professors take more seriously your project if you present research, as a backup of your intentions, a reason because you try to communicate something to the audience. Research is as important as brainstorming; it helps you to develop a project.	Professors motivate us to research.

Concordia and UASLP educators

	Concordia Educators	**UASLP Educators**
Methods	Professors ask students to get acquainted with their topic to get familiar with the topic, trace it, get to know the shapes, features, parts of it, origin, author, purpose. Students need to know about history of the case, current situation of the problem, and so on. Professors organize fill trips to museums, libraries and different places as ways of extending. Professors ask students to share research results with presentations, writing reports of it, formulating an argument to support their ideas. Professors promote collaboration with stakeholders, and with people associated with the project trying to get objective perspective of the problem. Students are asked to do both research and design simultaneously, facilitating the making and research, going back and forth. Professors encourage students to use all the skills, the expertise, the research, the thinking that they've been exposed to, practising and creating complex design thinking. Students are asked to create and lead a dialogue with the client to reflect on those facts. And become that source of communication and the intermediate between the user and the producer.	Students are asked to do research, all kinds of research. Research about clients, media, competitors, target, market. Students have a methodology to follow. Students have to design a plan and following it, assessing results. Each project requires different approach. The Design Plan of Studio Design courses has three levels according to the three levels of the program: beginners, intermediates and advanced.
Techniques	Professors promote research every minute, go to places, assigning projects that require research. Exercises include exploring spaces, and approaching places, recording, observing, and documenting it graphically. For professors it is very important to be specific outlining the criteria for assignments, requirements and evaluation. Outlining specific resources students can consult. Professors ask for a written version of the proposal, and all the process documentation. This action contributes to the formation of student habits.	Professors promote reading among students with small articles. They work with dialogue, questioning, analysis, and evaluation. Professors use to guide research promoting fundamental questioning of students. They said: the more questions the better; it is necessary to know how to make a question. Professors promote observation as foundation of research, looking and analyzing books, magazines, and all kinds of printed matters. A relevant part of the design process is the graphic corpus or previous design work on the topic. They use informal talks, virtual groups, ITs, funny books. Also conceptual maps, brainstorming, and drawings to promote reflection. Professors promote teamwork and individual ways of research by doing data collection, classification and organizing data in a creative way. Professors try to move from quantitative to qualitative methods of research, incorporating ethnography, sociology, and more qualitative methods of research.

Impact on students	Students don't do enough research. Sometimes there is a lot of research emphasis and they don't have enough time to create, so they really suffer. When students start thinking comprehensively about what are the real impacts of what they are creating as designers they can become empowered. It will create the opportunity for them to make a real difference.	Professors stated that once students know the methodology they will use it into professional practice. Research provides objectivity to the approach and understanding of the problem. Independent and creative research promotes development for everyone: students, professors, design practice and research. A real problem approach provides involvement, motivation, deeper understanding, and better identification of the problem or need. This exercise develops critical, professional, independent attitude and mind.
Professors' Attitude	Professors do research and the foundations of their projects are based on an inform manner. All their decisions are based on clear information, so they can make informed decisions. Students need to express in a very coherent manner their intentions, objectives, so the results can be articulated clearly. Because research is related to the concept, it is about thinking, it is about theorizing, it is putting into words what they are doing. Research is looking around and been aware of the environment. It is necessary to be sensitive about doing research in design with balance. Research can discourage the creative process and the creative process discourages the research thinking. Students reflect on their design ethos or philosophy, their parameters, intentions, perspectives as an insider and outsider, priorities, patterns.	Professors include marketing terms, strategies, and ways of thinking. They promote more managing skills. Professor said feedback and assessment should be applied at the end of projects. Students only want to draw and use the computer, but they give students freedom to make decisions and direction to the project. Experiencing new ways of doing research professors and students learn that there are many different methods of research, many tools of data collection, improving the approach to people, but students prefer traditional ways to do research.
Motivation	Students need to be sensitized to the issue by reading and looking at videos. Students need a lot of encouragement. But they are very comfortable with Internet, finding images. Professors encourage students to think about the contributions that they will make in a world. In this way students create opportunities for designers to make valid contributions and be respected in society and a Moore positive recognition to design as a practice.	With adequate data from clients, students will know how to help him. Research helps to define the concept and provide the foundations for their proposals. Professors bring all kinds of books, and promote among students to be aware of the surroundings. Students focus more on form than content. Professors promote writing skills through games, fun, and curiosity to bring their interest on content. They try to move students to a diverse ways of data collection by doing real projects. There are very standardizing methods of research that limits students' reflection and performance.

Design studio courses represent a series of core courses along the programs that evolves from sophomore, junior and senior levels. Each of educational institutions in this study provided specific, educational strategies that impact students' performance. The design methodology could be one of the best examples of constructivist theory in practice, where research plays a relevant role in design studio activities, which impact students' development, design outcomes, as well as the instructor's pedagogical development.

Terms used in this part of the study are provided by Carrasco (2009): "Strategies are all those approaches and behaviours that make the teacher handle with skill the student learning" (p. 83). The main strategies I have based the analysis on are: *methods* and *techniques*. "The teaching

method is the rational practice of the media, teaching techniques and procedures for organizing and directing the learning of their students toward the desired results" (Carrasco, 2009, p. 84), and he provides the foundations of methods that have guided the analysis at this point: order or sequence of the teaching elements, orientation to students for a better learning, learning objectives, students' adequacy and economy of time and efforts. Teaching techniques according Carrasco (2009) are "the teaching resources used at a specific time of the study unit or part of the method in the realization of learning" (p. 85). That is why in order to reach learning objectives, one method requires the support of a series of techniques. There are lecture techniques, collaborative techniques, reflective techniques, memorization techniques, evaluation techniques, among others. Each technique involves several steps, and there are simple or complex techniques.

I have looked at these cases in Mexico and Canada for the methods and techniques professors have implemented individually as well as collectively. I was also interested in *institutional facts* such as the curriculum, courses, and general faculty practices that may affect the learning outcomes of research-for-design. I wanted to know the *impact of research on students'* performance according to participants' perspectives; *instructors' attitudes* towards research, and how instructors *motivate* students to do research.

Methods

UASLP student participants have explained the way professors provide orientation, information and methods for promoting students' development. UASLP educators promote not only independent practice for problem-solving and decision-making, but also encourage critical thinking and motivation. Carrasco (2009) describes autonomous work as a self-learning process where educators' collaboration should be reduced to essentials. "Feeling source and origin of the

activity encourage the deployment of forces that would otherwise remain dormant" (Carrasco, 2009, p. 102). Any intervention an educator makes with regard to a student's task/assignment may be negative.

The main tool UASLP educators use in design studio courses is the design methodology called Design Plan. Ornstein (1990) states that as sequencing strategy problem-solving strategies are "integral part of training and can be used for solving straightforward problems" (p. 309). Educators ask students to follow the Design Plan which involves research for the development of their projects. Students collect data and document it; once they have all the information, they start a dialogue and questioning. Research, as stated in the UASLP Design Plan, includes reflective practice of reasoning, through diverse visual analytical tools. It is a reflective stage using conceptual mapping, brainstorming, drawing and teamwork (Martinez, personal communication, March 19, 2013). This reflective stage is not exactly a linear process, mental iterations start immediately not only involving data and reflection but the emergence of ideas as response of designers (Cross, 2007; Daalsgard, 2014).

Concordia student participants have commented the variety of educators' teaching styles; all professors follow a process or methodology, even though they do in their own way, they utilize different methods. Students need to know and adapt to educators' methods of design, and become enriched by this diversity in educators' construction of individual methods of design and research.

Both groups of students have to follow a design methodology. The difference is that UASLP has one institutional model that needs to be adapted to each project, each educator provides her/his own interpretation of the institutional methodology; and at Concordia each educator applies his /her own methodology independently. A design methodology is always

present at both institutions. The institutional methodology of UASLP provides an impact on the learning experience of research practice as it accompanies students throughout the whole series of design studio courses. Important to note, there are fundamental systematic differences between the Concordia program and UASLP's program with regard to methodology and historical foundations. Concordia educators with their individual methodologies for design come from a deconstructivist tradition related to postmodernism. UASLP on the other hand, with a predetermined methodology for design instruction that emphasizes iterations of design ideas using prescribed process finds its roots in Bauhaus and modernist theories of design.

Design methodology represents the main instrument to guide students through the design process setting research practice in all stages. Design methodology is a systematic collection of steps that follows a clear philosophical stance. Frascara (2008) explains the function of design methods: "Methods provide signs and indications, descriptions of sequences and processes; suggest actions and identification of factors, connections and interactions" (p. 97). But not all authors see design methodology as beneficial. Cross (2007) asserts:

> An aspect of concern in design methodology and related areas of design research has been the many attempts at proposing systematic models of the design process, and suggestions for methodologies or structured approaches that should lead designers efficiently towards a good solution. However, most design in practice still appears to proceed in a rather ad hoc and unsystematic way. Many designers remain wary of systematic procedures that, in general, still have to prove their value in design practice. (p. 109)

Even though, as educational strategy, it represents a core instrument to students. In the design studio environment, the continuing application of this design methodology provides an

effective development of students. Shakespeare (2008) situates: “Nothing is more stressful than the projective disciplines and nothing creates more anxiety in an adolescent than that lack of certainty about their skills” (p. 236). So, at school design methodology is the likely tool providing a suitable learning environment, understanding and orientation to students taking diverse paths in later professional practice. Within the Design Plan, UASLP educators have expressed they ask students to do data collection about clients, media, competitors, target, market, among others, setting research as the backbone of the design process. Meurer (2008) sees design as “related to the entire spectrum of physical and intellectual human interaction; the interaction between people, products and the world lived; and interaction products, in other words, between devices” (p. 221) so, students’ formation includes the skills to identify and understand those interactions or connections through research.

Concordia educators have explained teaching methods of design as a variety of simple, fun, conductive, and engaging practices of research and exploring the environment. This is a coherent, creative and diversified strategy aligning educational objectives with dynamic and effective learning activities. All these activities promote research and diverse skills connecting students with their community and context in an informal way, not to say based on scientific research methodology but more related to experiential and social constructivist methods of education. It is an effective motivational strategy since student participants have mentioned most of these activities. Educators have explained the necessity of balance “avoiding research overtaking creativity” (Carlisi, personal communication, April 24, 2013), by creating and researching simultaneously, in a back-and-forth manner. This strategy is aligned with Cross’s (2007) thinking about exploring solutions in the designerly way to explore and understand the problem. Dubberly (2004) stated: “Research must inform practice and practice must inform

research – they must co-evolve. This evolution requires invention, for example, fusing the studio and case-study methods" (p. 81). Research is innovative in this educational context; its motivational ingredient has a positive impact on students' learning. By interweaving student-lead research and student-developed design practices, the young designer begins to see the relevance of research to her or his work. This strategy should be explored more, providing more and richer opportunities of reflection, and iterations leading to an improved self-confidence and self-direction.

Concordia educators have emphasized collaboration. Triggs (2011) emphasized the possibilities this collaborative practice may provide to designers:

> What is emerging and needs consideration is the potential for 'new' knowledge areas of in the hybrid fields between disciplines and new forms of media. Designers can contribute to these subject developments and have a key role to play as facilitators of knowledge exchange through information visualization and communication with relevant stakeholders. (p. 125)

Thus, collaborative ways of promoting an objective perspective by approaching stakeholders and communities should influence personal learning. Collaboration empowers students' social skills, allowing them to get connected, become sensitive to a community, familiar, responsive, and even attached to their stakeholders and networks. This is a strategy based on exchange and dialogue, an open approach to the real world that involves interdisciplinary, flexible, integrated, and participatory professional skills necessary to solve complex problems. This social method for conducting research facilitates doing design in a socially charged manner.

Concordia educators have also emphasized strategic actions that involve Problem Based Learning. PBL represents a salient topic for discussion concerning specific features of the design education process, and opportunities of improvement of design and research education. First, projects are planned for students by being very specific, outlining the criteria for assignments and requirements including rubrics for assessment. A Concordia educator has explained: “it is important to be very specific outlining the criteria for assignments and requirements” (Moore, personal communication, June 20, 2013), adding relevant actions that build an integral educative experience. Second, projects require students to do as many iterations as possible, and evaluate them and review them along the way. The iterations represent not only a way to develop a designed object but also an educational strategy that involves research in many different ways and the opportunity to reflect on the role of research in design. Third, teamwork and real problems are necessary features of PBL providing effective learning experience about research that are not always present in design studio projects.

Techniques

UASLP educators have described how they promote visual research. Observation is a naturally developed skill of designers. Interest in the visual dimension of experience empowers the ability to know and discover. It is a common strength among people who are visually oriented and attracted to the design profession. While Concordia student participants have described creative techniques, having actually a significant impact on their perception of research and engaging ways to do research and explore people, objects, and places. Observation techniques take advantage of designers’ visual skills, empowering the ability of exploring and understanding a problem. Furthermore, creative visual techniques facilitate the analysis, understanding and assimilation in research practice, a *mindful learning* according Gowin and Alvarez (2005): “the

ability to view situations or problems from multiple perspectives rather than following one linear path of enquiry to achieve a specified outcome" (p. 26). This implies simplifying complexity to construct knowledge, in the case of designers supported by visual resources.

UASLP educators promote personal ways of visual research, classification and organization of data in diversity of visual tools for analytical reflection such as conceptual maps, brainstorms, and sketches. All these techniques represent visual research reasoning tools. These visual tools have been mentioned by several UASLP professors and students showing a preference from any other type of reasoning, enhancing the construction of knowledge structures, "modelling of characteristic design reasoning processes and on the nature of visual reasoning through the interaction with the various classes of the graphical representations of design must become a central subject of design education" (Oxman, 2001, p. 277).

Concordia educators have emphasized questioning techniques as relevant for research and reflection activities. Posing questions may be the beginning of the approach or the starting point of the design process. "Enquiry is fundamentally about asking questions and being curious. Enquiry means to discover, show interest, be motivated, problem find, problem solve, think, and create meaning" (Delcourt and McKinnon, 2011, p. 1). A UASLP educator has set questioning as basic components of research that requires knowledge and understanding of methods of enquiry: "I ask students to guide their research process with questioning, the more questions the better" (Yanez, personal communication, March 8, 2013). This tool of enquiry complements visual research as well, that develops design thinking and critical thinking. Triggs (2011) explained, "design thinking and critical thinking practice should form the basis of how we approach contemporary social and economic challenges. These skills inform how we identify and act upon situations where design can improve the well-being of a community" (p. 125). Questioning

accompanies the entire design process with the aim to reach the objectives of each step such as approaching the problem, defining the problem, setting the concepts, getting ideas, developing solutions and implementing the proposal. The precise formulation of questions for these purposes guided by professor and by practice will empower students for research practice. Collier *et al*. (2015) pointed out that:

> Students need to learn how to ask and answer new questions that arise. To answer the questions, they will need to learn how to filter the vast resources to find the information that they need. They will need to evaluate the resources for accuracy. Finally, they need to learn how to process sources of information to make thoughtful decisions in the future. (p. 1)

Moreover, educators have explained that based on this enquiry, students are asked to present their arguments enabling verbal and communication skills. Carrasco (2009) explained the main teaching procedures: logic-verbal code or words which process information in linear, logical and analytical way; visual-spatial code or visual language which provides an understanding of structures and the organization of the elements, processing information in a synthetic, intuitive and global way, and analogic code helping to apply knowledge to different things by comparison and similitudes. Carrasco (2009) emphasizes the use of the three codes, by putting ideas into words allowing the analysis, step by step of one idea that can be used as argument and support of ideas or proposals.

Educators from both cases have described the promotion of reflective and operative investigation through observation, questioning, dialogue and analysis in the classroom. As Shakespeare (2008) states: “Students must learn to face the challenge of change because school offers the means to perceive, reflect, criticize, and transform” (p. 240). But in order to make this

an effective practice of educators, reflection on their educational practice is needed. Specifically, educators would be looking at what the community is asking to designers and what designers should be contributing to improving the quality of life.

Impact on Students

UASLP student participants described three concepts related to research that they appreciate: educators provide liberty for decision-making; educators provide a methodology to follow which indicates when and how to do research, and students are guided to develop a design concept based on data collection. These are relevant issues that need to be revised in design studio courses since they represent key elements in design education including the promotion of self-learning, decision-making and the creation of communication strategies. In addition, UASLP student participants have described as memorable learning experiences, real approaches to projects that provide them motivation, involvement, and understanding of their role and contribution as designers. Concordia student participants have described the impact of special activities such as going out of class and walk observing and exploring specific topics. Those are engaging approaches promoting creativity and innovation, as a way to connect social and cultural dimensions to the proposals and giving effective shape to design solutions.

UASLP and Concordia educators share similar problems including students' lack of interest for research, and they share the vision of students approaching people and contexts in deep ways in order to have better results in understanding the scenario in design practice. UASLP educators expected students will use the institutional methodology in their later professional practice if they use it regularly at school. In this sense an alumnus has expressed: "I don't do a super analysis as I've been taught, but there are many things I do just automatically" (Pardo, personal communication, March 26, 2013). While Concordia educators have explained,

students become empowered when they work collaboratively and being involved in their community and they understand their role as communicators and start thinking comprehensively about the real impacts of what they are creating as designers.

Educators' Attitude

UASLP student participants have expressed that most educators promote reading, visual research among many methods of research, while following the institutional methodology. Design studio courses at UASLP produce communities of teachers who permanently collaborate in planning tasks, strategy development and evaluation. Concordia student participants have described their Concordia Design Department professors as very collaborative. Collaboration and teamwork have an impact on the whole culture and ethos of the faculty and the institution. Grundy (1999) has shared the indicators of strong commitment to collegiality and collaborative work practice such as: consultative approaches, reflect collaborative decision-making, and teamwork as common practice in the development of students learning (p. 48). This fact facilitates exploration of strategies incorporating innovative ways to promote research practice. "Where groups of teachers engaging in such critique in a spirit of trust and support, the resultant learning experiences for students [and teachers] are likely to be improved" (Warhust et al., 1994, p. 176). Collaboration helps to develop effective learning communities and coherent and engaging environments for research, creating shared strategies and techniques strengthening understanding and practice of research for design at the whole program level.

Educators in both cases have commented they need to continuously ask students to research because they only want to draw and use the computer. Although a UASLP educator has commented: "By experiencing new ways of doing research, we learn that there are many different methods of research, by many tools of data collection we improve our approach to

people" (Monjaraz, personal communication, March 14, 2013). Concordia educators have expressed that research empowers students to be able to create and lead dialogue with clients, and become that source of communication and the intermediary or interface between the user and the producer, working as a collaborator with stakeholders, being aware of what is happening in their social, economic, cultural, political and ecological environment through all possible ways. Meurer (2008) explains: "The crucial problem is to extend the concept of design to make way for new challenges and provide arguments that will launch it as social, political, economic and cultural action" (p. 231). That also contributes to the practice and understanding of design itself.

Motivation

UASLP student participants have emphasized that all professors require investigation from students in design studio courses. Concordia student participants have shared that the more research they do the more support they get from professors. So in both cases educators motivate students to do research, even though they need to do it in a creative way. UASLP educators try to move students to diverse methods of data collection by doing real projects because students are used to standardize methods of research that limit students' reflection, creativity, and performance. Fontana (2008) explains that "the role of professor must have a component of intimacy in each project. Teaching when generalized, depersonalized and standardized proposals, students take on habits that take years to shake off" (p. 218). While Concordia professors have explained, students in their early design education need encouragement and direction by instigating curiosity. Students need to be sensitized to the issue embedded in the design problem, taking into account students are very comfortable with the internet and finding images and using technology to solve problems. Concordia educators have commented that it is necessary to think more in the spirit of praxis, where research and design practice can be done at

the same time. Motivation represents a challenge for educators in contemporary educational contexts at undergraduate levels. Educators have shared some clues that help to connect students with reality, with possibilities and opportunities, to broaden design contributions to society, and to redefine the design profession of the future as well.

Institutional Facts

In the UASLP Design program the series of design studio courses are core to the curriculum. Following most public design schools, this learning model is a project based. This instance design education can be explained by Dewey's theory of learning through experience since he believed this kind of interaction in the classroom as a community sharing experiences and actions, with a common project in mind, enhances the learning experience (Dewey 1916). In principle, this learning model replicates design education in that it facilitates exploration, fosters curiosity, promotes social approaches, and boosts observation by solving problems from the real world. Dewey (1887) defined experience as the outcome or description of an event, incident or happening,

> It is not the sensation itself; it is the interpretation of the sensation. It is part of meaning. If we take out of an experience all that it means as distinguished from what it is – a particular occurrence at a certain time, there is no psychic experience. (p. 178)

Even though, Cuff (1991) sets the atelier system and the design problem as a paradigm of design education, following certain patterns coming from the Ecole des Beaux Arts:

> Certain of these patterns include the setting of problems as the initiation of the educational process. Setting the studio as a simulation of the professional environment. Setting the content of studio methodology as a series of well-

> formulated steps of the design process, such as the *esquisse stage*, and the graphic formulation of the conceptual design. (p. 271)

Design studio is an educational model used in most schools of design, with many variants and deficiencies but has demonstrated its efficiency as well. Real practice of research in UASLP design studio courses is very limited, "students are used to bringing information, presenting it, developing a graphic corpus, and sharing their opinion and that's it" (Monjaraz, personal communication, March 14, 2013). Students are reluctant to innovate with research; "their research is very limited and quantitative, when design is not only quantitative. For them, investigation is only surveys and polls" (Monjaraz, personal communication, March 14, 2013). So, students are used to traditional methods of research, in order to fulfill professors' requirements with no reflection that limits learning of research and design outcomes.

Concordia educators commented that all the Design Department faculty work in a collaborative way, sharing specific requirements for assignments such as students' presentations, students' reports of reflective statements of processes and concepts, including research. Informal but functional methods of research prevail at the Concordia Design program that has been described by professors. Even though this is true, there are not formal or institutionalized methodologies of research in design studio classes. Students have compared the Concordia Design program with other programs at Concordia, where formal methodology of research is a requirement, and for these students that would help them in their design education.

According to educators, in both UASLP and Concordia University, theoretical research courses and design studio courses are not well connected. Research education can be improved and strengthened in this specific situation. Questions remain among educators. What is the content of research courses that can't be applied by students in design practice? What is the

difference between research in theory and research-for-design practice? How deep should be the content in research theory courses? Which educational strategies may bring theory into practice? In this sense Frascara (2008) has emphasized the skills of the researcher:

> The researcher is the main instrument in the collection of information in ethnographic research. The skills required to include knowledge of an anthropological theory of culture, the capacity for empathy, refined perception of cultural and social quibbling, and the ability to discriminate between common situations of idiosyncratic behaviour and conduct, as well as the ability to take notes, organize and condense them into a coherent analysis. (p. 111)

Those abilities represent advance skills of research that should be developed throughout the whole program and taught from the starting stages of any design career program. “Even in the early stages, designers must learn to incorporate knowledge of human factors and user feedback into the design process” (Winkler, 2008). Even though in practice both institutions are striving to meet the goal of incorporating research into the design process, they are still exploring possibilities that may contribute to research-for-design.

By comparing Concordia and UASLP participants have emerged ways to improve the education of research-for-design that includes the use of a methodology of design as a main guide for students, collaborative team work and real problems when using PBL. The use of visual research process of enquiry facilitates creative ways to connect social and cultural dimensions of problems and collaborative effort among educators.

Benefits of Research Practice in Design Education

What are the benefits of doing research?

In this question I have explored students and professors' ideas about the effects of research on design practice in educational and professional contexts. Creativity, effectiveness, interaction with clients, interaction with users, self-development, and career development classified information the data gathered in this study (See Table 19). This information may provide participants' ideas for conducting research that they did not express in previous questions. These answers also may help to understand research education in design for the development of design students and the advancement of graphic design. It may provide information about how research is perceived as a tool in evaluating program performance and development.

Table 19

Benefits of doing research by Concordia and UASLP students and educators

Benefits of doing research		
Concordia / UASLP Students		
	Concordia Students	**UASLP Students**
Creativity	Research improves students' conceptual work, providing back up to ideas. It opens people up to more knowledge in different areas. It helps to involve more people in the project with the solution. Students get into interdisciplinary design. It helps to get more resources to look out.	Research helps students to connect and become more sensitive about the topic. It provides more visual resources for the proposal, so the proposal can be innovative. Students can be more creative about media and communicational strategies, incorporating people's perspective in their proposal.
Effectiveness	With research students get more chances to do the right thing. It opens doors for people and opportunities. It helps to understand something students may not understand before. Students get more different kinds of information. Research makes the design process easier and faster.	Research helps students to fill their own expectations. The outcome improves. They can identify the needs or features of the problem. Students get to know better the audience, the context and even the role of graphic design. I can verify the results. Research helps students to incorporate new media and technologies improving the use of resources.
Interaction with client	Research helps to present and to defend more adequately students' work. Students get abler to express freely what they want to say. It helps to involve the client in the project with discussion and analysis. The client feels designers are taking it seriously, and they care. It really helps to build a rapport with them.	Research provides foundations and professionalism to the project. Designers would identify all kinds of needs.
Self-development	Students feel more able to express confidently and adequately. Research helps start to change, it is a way to keep improving their design practice. Students can identify different skills other than design.	Students' life gets richer with all the information. All kinds of information help them to updating and to improving as a person. They learn all kinds of things, and relate with all kinds of people.
Career Development	Students get more possibilities to reach the excellence. Research helps in the way students work, teach, and communicate.	Students learn from other disciplines and they become more motivated.

Concordia / UASLP Educators		
	Concordia Educators	**UASLP Educators**
Creativity	Providing foundations for the projects on an informal manner. Students can set coherently the objectives. The work will get a higher level, richer, with more refined concepts. It brings originality. Students become innovative, reflexive and adaptable thinkers.	Students can produce more ideas doing research. Students can recognize and develop their own way to face a problem and their own perspective about it. Research allows an approach to the real world, and builds a perspective from reality.
Effectiveness	Students can make informed decisions. They can link between the initial intentions and the final results. Student gets more informed. You will go further.	Students can reach further and further by researching. Research facilitates the identification and understanding of the social dimension of the problem. Doing research students become more assertive, so they can identify exactly what is useful. Research promotes to explore out of the program, and out of the discipline.
Interaction with client	Students can clearly and coherently articulate their discourse and the results. Students get confidence for interaction and getting stakeholders involved in the project.	Students improve their communication skills by doing research. Research opens up to other kinds of thought, to different perspectives.
Self-development	Students can express in a very coherent manner. Research is knowledge. Research educates designers. It develops critical thinking on designers. Students learn in different ways. You distinguish yourself from others. It pushes students to go further with a sense of achievement and gratification. It promotes to have a unique perspective of the world. It develops imaginative thinkers.	Students can learn from others. They can learn Moore. Students can participate in developing and controlling their own learning process. Research promotes self-learning. Students learn about research methods by doing it. Research allows exploration of personal possibilities and skills.
Attitude	Research helps to produce a meaningful, cleaver, and sustainable design. It makes the project sustainable. It provides balance between rational and emotional response of designers.	Students can get more and diverse perspectives. Students got to understand their role as graphic designers. Research provides students' self-confidence and they become more outgoing, proactive, and dynamic. The practice of research allows constantly updating.

Creativity

UASLP student participants have recognized the institutional design methodology "Design Plan" that generates creative outcomes by guiding data collection, comprehensive analysis of the problem, and facilitating an adequate formulation of a solution. Concordia student participants have explained how research improves the conceptual work of design providing information for ideas and directions, opening up the design process to more and better possibilities. These are attitudinal or affective results in higher level thinking such as synthesis and creativity that are located in the top category of the Affective Domain in Blooms' Taxonomy. Similarly, Eisner (2002) has pointed out:

> I mean attitudinal results as the will to imagine possibilities that do not exist today but that might exist. The desire to explore the ambiguity is prepared to

> avoid a premature conclusion in finding solutions, and the ability to recognize and embrace multiple perspectives and resolutions that celebrates the work in the arts. (p. 145)

Eisner discusses the value of purely creative experiences for learners in the realm of art education K-12 and beyond. The challenge for design education is to marry creativity with a specific design mandate and the resulting outcome. Somewhere in the design process this notion of open-ended creativity must be informed by research. UASLP student participants have emphasized that research connects with reality, so they become more sensitive to the scenario. Solving real problems has been recognized as an effective learning strategy. Eisner (2002) described what students learn from the aesthetic environment: "The quality of the experience that the arts make possible is enriched when they are experienced in the context of ideas relevant to them. Understanding the cultural context is one of the main ways to achieve this enrichment" (p. 143). UASLP educators added in this sense that research allows students approaching to the real world, and builds their perspective from reality by finding connections, associate, distinguish, differentiate, and become more sensitive about the whole scenario. Both student and educator participants agree that creativity improves by associating with the real world, with all stakeholders, media, and technology. But the impact of graphic design can be measured by its effect on users or audience that is defined by the purpose of communication. As we have seen, this is achieved with aesthetic and functional aspects of communication.

Educators have also explained research really needs to accompany this personal intention, thereby to go deep, to go beyond, and to learn more, it is what makes the student more creative as a result of a deeper knowledge base. This student attitude has been recognized by Concordia educators as the motor of creativity, but mostly it can be identified as a more refined self-

motivation. An UASLP educator has expressed that this attitude is critical, enabling research to generate more proposals, more ideas, because “the more they (students) explore, the more they learn, the more they can create” (Yanez, personal communication, March 8, 2013).

Effectiveness

Students in both cases agree that research provides wider and deeper information, more understanding and more resources to make effective decisions. Concordia students have included mock-ups as one of the most relevant research tools for exploration and evaluation of proposals as well as the client’s needs and objectives; this is a clear example of research in the middle of the design process. These students have explained how research allows a comprehensive approach to the topic including historical concepts, social context, meanings and related symbols, colours, images, and terms providing foundations to the proposals. UASLP student participants have mentioned the approaching of clients, end users, and context being explored out of school, and out of the discipline. While interdisciplinary perspective of Concordia student participants and educators also have an impact on research practice with an integrative and broader view. They have also explained that integrative thinking of research contributes to understanding people by exploring beyond design constraints.

UASLP educators have described visual analysis tools such as conceptual mapping, comparing diagrams, tables, and drawings that enhance the approach to the problem by describing, interpreting, associating, distinguishing, contrasting, differentiating, and discussing it in order to be able to understand the scenario more clearly. While Concordia educators have explained, research helps students to articulate clearly and coherently their objectives. In this way, they can link initial intentions with final results.

Interaction with Client

Concordia and UASLP student participants see research as the practice that facilitates and promotes an effective interaction with clients, enhancing communication, collaboration, and understanding, which results in a stronger design practice. UASLP student participants have explained dialogue with clients and stakeholders not only provides relevant information, but also motivation and sensitization, because real approaches to the client clarify the contribution and responsibility of design. It opens up the possibility to other kinds of thoughts and different perspectives as students formulate solutions to the design problem. Similarly, Concordia student participants have expressed that research can improve their personal interaction skills by collaboration and interdisciplinary teamwork.

Interaction with Users

UASLP student participants have described how research helps to update social contexts and shed a light on how these contexts evolve. Through surveys and pols students identify audience preferences, the context, the role of graphic design, and they can verify results and the impact on people and contexts of their proposals. Concordia students have emphasized designers' responsibilities to understand and relate to users: "We have to understand people's needs and wishes, and create the objects that meet them. The objects that we create are embedded in people's actions and situations" (Frascara and Winkler, 2008, p. 11). Students have explained that research helps to connect with the audience; it really helps understanding users' interests and ways of thinking that differs from designers' way of doing it.

Self-Development

UASLP student participants have expressed that their whole life gets richer with all the information coming from research, learning all kinds of things. While Concordia student

participants have expressed research practice helps to develop self-confidence, to improve design practice with education, experience, and critical thinking. Moreover, they have emphasized research improves how they relate with other people in all aspects of their lives.

UASLP educators have explained that students developed their own research methods in a constructivist manner by following the process of enquiry in an individualistic way. They get more confident, more assertive, more organized, more logical, and even more outgoing. Meanwhile Concordia educators have explained that research generates knowledge, education, imagination, and critical thinking. Students participate in developing and controlling their own learning process promoting self-learning and identifying their own potential and skills by social interaction and community involvement. Frascara and Winkler (2008) have expressed that "imagination, open mindedness, and alertness to a broad field of possibilities: indispensable components of good research, which goes beyond the mechanic application of proven methods" (p. 7). By doing research UASLP students learn in different ways, they distinguish themselves from others, and it promotes a unique perspective of the world. Research helps Concordia students to reach at points they never imagined, in terms of positive outcomes, and develops diversity of skills other than design.

It is worth noting that two theoretical frames mentioned in the methodology of this study are emerging in the data. Clearly UASLP is aligned with constructivist models of learning as evidenced by both student responses to and educators' delivery of the curriculum and assignments. Conversely, Concordia reveals a tendency to a social constructivist model informed by students looking outside the field of design to expand their learning through social interaction.

Career Development

UASLP student participants have expressed that research helps to implement better comprehensive, well-done projects that connect better with users. UASLP educators have shared that research helps the designer to become a communications strategist, this skill is critical for social problems were "opportunities for conceptualizing large information environments through research, which is ideal for communication design, as each of the possibilities rely on communication skills. But most designers have been ill prepared for these tasks by their institutions" (Frascara and Winkler, 2008, p. 6). So, it is necessary to improve and deepen communication skills in design programs based on research practice.

Concordia participants agree that interactivity with the community and stakeholders represents the key to professional practice, showing wider horizons for development. Concordia educators have explained research helps to produce better outcomes: more informed, richer, with refined concepts, and better proposals, that make the project sustainable. Research provides balance between rational and emotional response of designers. Research also provides a wide diversity of design applications and job opportunities as students take the chance to explore their own resources and skills. Research provides the skills people are expecting from designers that are: innovative, reflexive, adaptable, imaginative. Designers bring a unique perspective of the world, and contribute to people's everyday life in a sustainable manner.

UASLP and Concordia participants have described the benefits of doing research with, concepts such as: communication skills, interaction with the community and stakeholders, sustainability, rational and emotional balance, exploration of the one's own skills, and performance of designers' contributions, make design practice become meaningful, cleaver, and sustainable through research.

The Learning of Research for Design

How to improve the learning of research in design programs?

In this question I have explored ideas and possible contributions from student and educator participants about how to improve the teaching and learning of research in graphic design programs. Categories for data collected were methods, techniques, program considerations, motivation and attitudes, and skills (See Table 20). This question has been set based on participants' experience as well as facing their future perspectives of graphic design.

Table 20

Concordia and UASLP participants' ideas to improve learning of research.

Ways to improve the education of research		
Concordia and UASLP students		
	Concordia Students	**UASLP Students**
Methods	Visit more at shows, galleries, and museums. To go out more and learn how to observe the surroundings and document it. We should write more when collecting information, preparing a presentation or doing a diagnosis.	It is necessary to promote reading among students. Providing training to professors and the dialogue to make agreement on content, exercises and terms. Verification and measurement practice to ensure reaching objectives as well as strategy to improve design service and performance.
Techniques	Doing more reading about design. Professors and researchers should use more examples and share what they are doing on research. Professors should explain more about how to research. Physical prototypes can be very helpful for analysis, exploration, experimentation, and assessment.	It is a teacher-student commitment to work side by side. It is necessary to promote teamwork, and interdisciplinary work. Methodology is the best tool as a guide in the design process.
Program considerations	Creating more in class time. Professional practice is really helpful.	Coordinate horizontally Studio Design with the rest of the courses to support each other's purposes. Professors should have professional practice. Professors should promote skills such as: communication, management, marketing, environmental care, business, sales and advanced computing.
Motivation and attitudes	Promoting permanent observation of designs in our environment. Professors should use more visual resources. And doing design for a cause it is exciting.	Professors motivate students to research. Promoting environmental awareness. The more research the more impact on society and recognition. It is necessary to form service attitudes as well as the desire to improve the quality of life. The client has a lot of needs that the designer could identify and solve through research, dialogue, and empathy.
Skills	Keep yourself updated and your mind active.	It is necessary to develop leadership, management, and a proactive attitude, initiative, with rational support. It is necessary to explore diverse areas of design and new technologies, looking for applied and useful design.
Concordia and UASLP educators		
	Concordia educators	**UASLP Educators**

Methods	It is the responsibility of all the professors to put emphasis in research among the students. Grading higher any research practice. Providing a common forum or place to share about research for students and professors. Exploring real cases where students can develop research skills and real applications. Improving language skills as communicators. Avoiding research discouraging the creative process and creative process discouraging the research thinking. Trying to mix up different ways to do research not necessarily announced as research assignment. It could facilitate the learning process to analyze the making, the physicality of working and the flow concept, creating, revising it, making mistakes, and adapting and moving forward in an iterative cycle, and learning from those experiences. The critique is the most productive aspect of studio design; it brings ideas, multiple voices, and different perspectives.	Teaching how to make the diagnosis of design problems. Research should be applied systematically along the 8 to 10 terms in design studio courses. Always ask students to support proposals with collected data of research. Promote applying exercises of research. Use of conceptual maps, brainstorm, drawing, and dialogue to analyze the problem. Following a methodology facilitates the design process and critical thinking.
Techniques	Promoting critical thinking in class. Promoting research for writing, for practising, for reading. Promoting iterative process in different ways, iterations are pleasant and prolific. Doing a more organic research connecting with social and physical environment. Creating smaller scenarios or smaller set ups for students to do some inspiring things, little research exercises and them having a dialogue around that. Creating scenarios where students engaged with approaches to problems in a more complex way, taking into account all the people involved. Students should explain all about their projects and what they think is its main contribution. We should develop a method facilitating a design process informed by very different areas not just from the side of design language, and project from many different directions. Promoting a collaborative way of working. Promoting exchange of ideas between all people in the design studio.	Analysis of previous design projects. It is necessary to teach teamwork, and interdisciplinary work. Helping students how to organize their thinking, focusing on mental processes (inductive and deductive) and creativity. Promoting critical thinking from all perspectives. Research should be taught adequately for undergraduate level, basic but well developed, integrating research seminars within design studio courses. Promoting coherency between the research results and the final proposal by close supervision and reading student document. Promoting at design studio dialogue, exploring, experimenting, and assessing ideas. Incorporate the internet and the new technologies at the classroom.
Program considerations	It is a curriculum issue, shared by the community of professors to promote research. Design studio is the best place to promote research practice. Theory class is the right place to teach about research theory. We should integrate design studio courses and research seminar in a more functional way, strengthening the way research and design are approached by relating each other in a better way. Design creation is design research is design practice. Including a thesis or final project at the end of the program. So students could have the experience to really go in depth by doing research. Including technical skills, history, and interdisciplinary work. The benefits of doing general design approach versus the specialized design that provides the skills to face new contexts and changes.	Involving professors with professional experience. New curriculum is going to strengthen research. Awareness of flexibility and adaptability of Methodology of Research by continuous and conscientious practice.
Motivation and attitudes	Environmental crisis is demanding to designers understanding and awareness of it with sustainable solutions based on research. It is necessary to include more thinking, more holistic, and applied to think. In order to motivate and inspire our students, we should not label as research our data collection, but asking them to do little and simple activities. Make aware of job opportunities in the social market. Research process develops your own voice as designers and as a person, and it may empower your contribution to society. Choosing current topics about things that are happening in the city, in the country or in the world, so students can be connected to it and excited by it. Strengthening the collaborative work as well as the migration of disciplines. Designers are empowered because they participate in the activities of everyday life. And influencing the way that people think about the everyday life.	Promoting curiosity and reflection about cultural contexts, promoting self-learning. Showing the benefits of searching. Vivid and real learning experiences can show new perspectives of design. Teaching by example. Promoting research attitudes and habits. Expanding design vision, professional vision, quality.
Skills	It is necessary to connect design, research and sustainability. We need students doing more ethically, social justice, and environmental change projects. Looking for the perfect balance between form, function and sustainability. To open minds for exploration and experimentation, for more people to intervene in the project. It is necessary to develop an ethical approach to our profession. Following a spirit of praxis where research and practice can be done at the same time. Promoting awareness of the human relationship with all stakeholders around the designed artifact. Create environments in which students are free to provide diverse solutions based on their own perceptions and directions. We could encourage students to be the instinctive ethnographers and let them approach stakeholders in their own way. Research needs to be seen as part of the design process, and not in terms of a sequence, but in terms of a continuous revision, a continuous interaction between where you go for inspiration, and how you get more knowledge, how you evolve the project to a certain degree. We need to understand the network in which design exists by researching. So we need to broad and look at how design relates to complementary disciplines. We need to combine the holistic sense of human beings, combining mental and physical activities.	Promoting critical observation as an attitude. Real projects bring increasingly complex and interdisciplinary exchange as opportunities to learn new ways to research and better understanding of graphic design role. Promoting critical thinking in a comprehensive way of the cultural context. It would help to identify opportunities, ideas, and possibilities. Promoting skills such as: writing, speaking, and presenting as well as management, organization, and leadership. Reflecting on what kinds of skills and attitudes should be promoted among designers.

Methods

UASLP student participants have expressed a perspective on student-educator commitment using the institutional methodology and promoting research. While Concordia student participants have asked educators to explain more about research; they also asked instructors and researchers to share what they do in investigation.

Dubberly (2004) has gathered more than 130 models of the design process as references and he stated: "Our processes determine the quality of our products. If we wish to improve our products, we must improve our processes; we must continually redesign not just our products, but also the way we design. That's why we study the design process, to know what we do and how we do it. To understand it and improve it, to become better designers" (p. 5). UASLP educators have expressed the relevance of the institutional design methodology or the Design Plan, where a vertical perspective of curricula is systematically applied along the eight to 10 terms of design studio. It is adapted to each level of the design program. The Design Plan facilitates students the understanding of the design process and research practice by organizing their overview of the program, allowing them to practice mental processes and critical thinking. UASLP educators have intended that it is necessary to follow the Design Plan with adequate rigour by all the instructors. In this way students would deepen and internalize the method by continual practice. With regard to Concordia educators, they have commented that teaching of research could be improved by creating an institutional design methodology specifically for studio design courses, including more organic research and connecting with the social and physical environment. It should be informed by different fields of enquiry, not just from graphic design, which would take projects in many different directions, involving diverse types of design.

UASLP educators have stated the need to take fear of research away from students by making the process meaningful, attainable and practical. This way of learning research involves familiar examples and everyday activities. Reading (2009) states that "pursuing lines of enquiry that are personally meaningful appears to be helpful to students' engagement" (p. 260). So, in teaching research is necessary to relate to students' experiences in order to facilitate understanding and commitment. Concordia educators have also emphasized avoiding student discouragement with research because it impinges on the creative process and vice versa. By doing so, Concordia faculties hope to follow a spirit of praxis where research and practice can intersect. This is not only a motivation and educational strategy to follow, it is necessary to understand the co-evolution of the problem solution as part of the design method (Lloyd and Scott, 1994; Kolodner and Wills, 1996; Cross, 2001a; Daalsgard, 2014).

> Designers tend to use solution conjectures as the means of developing their understanding of the problem. Since 'the problem'; cannot be fully understood in isolation from consideration of 'the solution,' it is natural that solution conjectures should be used as a means of helping to explore and understand the problem formulation (Cross, 2001a, p. 84).

So, it is necessary to explore this aspect of the design process in the way educators' guide students that allow for parallel moments of research and design, instead of lineal process, incorporating it in the iterative style of designing.

Concurrently, UASLP educators have explained research needs to be taught with better integration of research seminars (research theory) within studio design courses (research practice). Studio design should facilitate students' dialogue, exploring, experimenting, and assessing ideas applying design and research theory. Concordia educators have commented

theory class is the right place to teach how to do research, and design studio class is the place to promote theory and research through practice. And they've added, it is necessary to include more integrated thinking, more criticism, applied problem-solving. This is one of the most relevant findings in this study, because it represents one of the main problems of research-for-design learning. How to guide students to connect the information and insights gathered through investigation to inform their proposals and concepts. Educators in both cases have explained that more effort is needed to facilitate the integration of research and design practice. It is not a mere balance between theory and practice, but the interactive educational strategy of two ingredients trying to help students to understand research purposes by doing and discovering by themselves their own design process. (Gedenryd, 1998).

Finally, UASLP educators have expressed the need of training design studio educators about research methodology. Professors need to explore research in diverse fields of the design process, one example is the implementation with materials, processes and technology, and another is evaluation of designed outcomes. Both represent issues that were not mentioned in participants' comments that make me think there are some inherent weaknesses in design studio classes.

Techniques

UASLP student participants focused on three main ways to support research. One is the promotion of reading, two is the practice of assessment and measurement, and three are educators' collaboration by promoting agreements on contents, terms and strategies. UASLP and Concordia educators have also expressed that it is necessary to promote collaborative ways of working for the exchange of ideas among all professors of design studio courses. Concordia student participants have mentioned the value of going out to explore, learning how to observe

and write. Writing and reading is a developed skill in the Concordia academic culture, providing strong foundations on presenting and documenting projects that represents an impact and an advantage on learning research.

Motivation and Attitudes

UASLP student participants have focused research on service and deep understanding of clients and users as a way to improve quality of life. While Concordia student participants insist on improving research through observation skills and motivation based on projects with a cause. Cartier (2011) found in her studies about design students' expectations that "they still want to see and touch real objects and communicate with real people by the helping with social activities like fairs, seminars, openings, travelling, etc." (p. 2191).

UASLP student participants explained that it is necessary to develop leadership and management, as well as a proactive attitude, initiative, with rational support of research, looking for applied and useful design, exploring diversified areas of design and new technologies. While Concordia students have commented that research keeps oneself updated and one's mind active. Cartier (2011) explains that "most valuable aspects of educational expectations of the students in design education come to light as subjects which help them to gain the attributes, skills and knowledge in the field which promote their creativity, innovation and can help them solve problems and help them design artifacts that respond to human needs" (p. 2190).

UASLP educators expressed that research should be taught first, by promoting curiosity; second, highlight benefits of searching for design; and third, through vivid and real learning experiences that will develop new perspectives in students. Salmon explains that genuine and personal features of experiential learning suits with the goals and values of art and design education (Salmon, 2000).

Concordia educators have explained students should be aware that the research process develops students' own voices, and that empowers their contribution to society. Sullivan (1924) has emphasized the subjective perspective of research: "Subjective experience is a powerful form of human knowing. It frames our very being. The knowledge we bring to encounters with art and life is crucial for re-imagining what might be" (p. 7). That also empowers students' individual contribution and understanding giving value and relevance to one's own perception.

UASLP and Concordia educators have also expressed the need to instruct for a more ethical and environmental type of design, incorporating social concerns, technology and sustainability. It is clear for them the responsibility of graphic design and the particular position of this career to address these issues (Bertling, 2015). That may be done by reflection, "taken-for-granted theories and concepts that govern our disciplines and circumscribe our thinking," in order to reveal, "the ongoing inequity and social injustice that shape our society" (Ladson-Billings, 2003, p. 11). The social and ethical ramifications of graphic design are a new and expanding aspect of an industry that has been closely associated with consumerism, advertising and marketing, which at times have been at odds with the ethical dispositions of artists. Newly emerging is the convergence of design and ethics.

Concordia educators have envisioned exploration and experimentation, to keep students' minds open for more people to intervene in their design, and allow students to practise and to make mistakes because they will learn better from those experiences. Of note is the phrase "make mistakes" in this data. Only recently have educators begun to recognize the importance of mistakes in the learning process. Dewey (1965) explained reflection as a process in which is necessary to allow students to make mistakes as cognitive individuals. Traditionally, design education eschews mistakes; the end goal has always been to find success for the client. Curwin

(2014) comments, in this sense, that mistakes should be considered as learning opportunities, allowing students to work more freely and engaged. This new approach allows students and educators to use mistakes from which to learn that applies to research-for-design in the process to approach the real world and change our paradigms of it.

Skills

UASLP educators have commented learning research should be by doing research, such as critical observation and critical thinking in the development of a project. Baum and Newbill (2010) found that critical and creative thinking in design develops students' specific attitudes and dispositions such as:

> 1. Avoiding impulsivity, embracing multiple points of view, judging assumptions, remaining open-minded and tolerating ambiguity. 2. Keeping students motivated long enough to solve the problem at hand, by intrinsic motivation and simple persistence. 3. Students remain confident of their abilities to solve the problem at hand. Exhibiting courage of convictions and taking risks. (p. 32)

Those attitudes are critical while working in design studio courses and professors need to promote, to favour research learning and design. Concordia educators explained that it is necessary to connect design, research and sustainability and this is a confused learning situation for students as, "time spent teaching tools and craft must be balanced with the time necessary for students to gain tacit knowledge in ideation, collaboration, sketching, and remaining nimble and creative under pressure" (Sherwin, 2012, p. 7). Another way educators can encourage students to develop these faculties is by developing collaboration and communication, promoting relationships with all stakeholders and networks in which design exists by researching and

focusing on the understanding of much broader view of these communities. This may balance the focus on many project objectives ranging from sustainability to inventive and effective design across a team of interdisciplinary players. Ultimately, educators should let students approach stakeholders in their own way and capacity. Sherwin (2012) in his studies about skills designers must master has explained collaboration: "But to collaborate well, you have to squelch your ego, speak your mind, bring in partners from other disciplines beyond design and know the business problems you're trying to solve" (p. 6), which, are also requisite for research practice as well, so it is a requirement, an interdisciplinary and team work to explore this open mind and collaborative attitudes.

Summary

This comparative analysis of teaching and learning of research-for-design has facilitated the identification of the best practices in education, by showing differences, similarities, and valuable ideas that may contribute to the strengthening of the education of design.

This study found several important differences; one of them is students and educators' academic backgrounds. In the case of students, on the one hand, students in Canada have studied two years before going into the undergraduate level. These two years of studies, which include graphic design and computer training, provide strong background that facilitates learning of research. On the other hand, UASLP students go directly from high school to the undergraduate level with no design practice and limited experience with computers. This lack of experience has, as a result, a late understanding of research because students need to focus on issues like theory of design and computer training.

In the case of educators, while Concordia's faculty come from a variety of disciplines; UASLP educators, they all are graphic designers. This issue shows that Concordia educators, because of

their diverse backgrounds, welcome a variety of perspectives and opinions from stakeholders and professionals from other disciplines. In comparison, UASLP educators lack this openness, which affects both positively and negatively the students' interdisciplinary, collaborative, and team work skills. Multidisciplinary educators contribute in the approach of issues that graphic designers face frequently with a wider understanding of problems and their solutions. The complexity of contemporary environments demands this openness from designers. If UASLP incorporates diverse disciplines in its faculty, this could broaden the perspective of design and research.

Another difference is formal and informal ways to do research. They have emerged by showing influence from the design streams created by the Fine Arts Faculty that hostess the Design program in Concordia University and by the Habitat Faculty that hostess the Design program in UASLP. The Arts stream of Concordia and the Design stream of UASLP influence in this issue when Arts stream promotes informal, creative and innovative ways of doing research that facilitates the learning of research, while Design stream aim is to approach formal and scientific research producing educators' negative reaction that affects the promotion of research. UASLP education of research could be strengthened by incorporating informal and creative ways to learn research.

The other difference is social versus commercial focus of projects. The responses from Concordia's teachers and students demonstrate how social design facilitates in a relevant way the understanding of research-for-design in areas like education, security, and health, among others, which demand effective immersion in communities and promotes a view of a sustainable design. The response from UASLP shows commercial focus of projects, which require research as well, but limit the scope of design applications and opportunities for students to approach society in a

broad way. The inclusion of social design at design studio allows innovative ways of research and engaging styles of education.

The view of the ethical and sustainable design as a main concern of Concordia participants is the last difference. This perspective of Concordia students and professors situates the discipline in agreement with global efforts, which promotes thoughts, attitudes and actions that demonstrate a concern about society and the environment. The UASLP responses from students and professors have shown a lack in this area. The ethical and sustainable aspects of design were poorly mentioned by UASLP participants, and indicate superficial relationship between designers and users. This issue can be improved by effective education of research which strengthens the understanding of society and boost sustainable thinking among students.

Some similarities were found in this study too. First, Project Based Learning instructional strategies prevails at both universities, where students and educators explained that approaches to real problems with PBL facilitate the connection to social environment. The understanding of the way that graphic design influences social change helps to comprehend research. Second, the responses of two samples stated that designers connect people to people, things and ideas, as an interface through visual communication. Consequently, designers' communication skills need to be developed and supported by research practice because designers are facing new situations that demand innovative tools for collecting information.

This research has also identified the best practices in education of research-for-design looking at students and educators' design processes. These processes are seen by both institutions as non-linear, organic, and iterative practice that involve personal, intuitive, informal, spontaneous, ludic, innovative, visual, creative, human, and emphatic ways to do research. These features of research will enhance exploration of people and places by design thinking and

enquiry, as well as collaborative and interdisciplinary skills that enrich the design process. One best practice is the institutional methodology of design that UASLP uses along the whole program. It represents an instructional tool that Concordia could explore in order to fortify research education.

To finalize, this analysis found that education of research-for-design demands creative ways of learning and connecting with society and its cultural and physical environment. In this way, research-for-design will be empowered by promoting ethical, sustainable, comprehensive, integrative, and broader scopes of design.

Next chapter a summary of my conclusions is presented by showing differences, similarities of cases as well as those contributions to the education of research-for-design.

Chapter 5 Conclusions

In this chapter I will summarize my conclusions based on what I have identified as relevant about teaching research-for-design in graphic design programs from participants' answers. I have focused on a general analysis of the two programs, an evaluation of each program based on data and the mandates established by the Icograda Design Education Manifesto 2011, and comparison of both cases with regard to research-for-design, as described by Concordia and UASLP student and educator participants. I have searched for those activities that may strengthen the interest in research among students, or facilitate the research process bringing methods that aligned with students' skills or methods connecting with students' ways of learning. As a starting point, I have considered a salient comparison of the two cases that quickly shows philosophical and institutional perspectives that influence and inform research-for-design (See Table 21).

Table 21

Summary of comparison analysis of both cases.

Summary of comparison analysis of cases	
Concordia	**UASLP**
Interdisciplinary Perspective	Design Perspective
Postmodern philosophy	Modern philosophy
Nonlinear curriculum	Linear curriculum
Student path of thinking not directed by the curriculum	Student path of thinking clearly defined by the curriculum
Social applications of design	Commercial applications of design
Digital design philosophy	Bauhaus philosophy
Iterative approach to design process with multiple models at play	Redactive approach to design with a singular design plan approach
Post-consumer ethos	Consumer ethos

Intuition and research	Determinism and research
Creativity comes from social interaction	Creativity comes after social interaction
Student is formed to be a social agent	Student is formed to be self-determinant
Social constructivist implications	Constructivist implications

In Table 22 there is an evaluation resume of each case using as reference the principles of the Icograda Design Education Manifesto 2011.

Table 22

Locations based on Icograda Graphic Design Education Manifesto 2011 summary

Comparative of locations based on Icograda Graphic Design Education Manifesto 2011 summary			
		Manifested Yes or No	
		Concordia	UASLP
1	Create self-reflective attitude and skills to adapt and evolve with changes	yes	yes
2	Use of multimedia	yes	yes
3	Promotion of cross-cultural and transdisciplinary work	no	no
4	Incorporation of theory, history, criticism, research, and management	yes	yes
5	Teaching of quantitative and qualitative research methods	yes	yes
6	Practice of interdisciplinary work	no	no
7	Formation of students for technological, environmental, cultural, social and economic change with democratic and integrative learning	yes	yes
8	Disseminating self-learning and updating skills programs and research training	yes	yes
9	Strengthening social and environmental responsibility	yes	no

In Table 23 there is a resume showing specific research-for-design activities that each case has expressed they actually practice from the Design Process Model (See Table 15).

Table 23

Locations based on the Design Process Model and specific research-for-design activities

Comparative of Locations Based on the Design Process Model and Specific Research-for-Design Activities				
Stage	**Methods**	**Features**	**Concordia**	**UASLP**
1. Exploration	Observation, reviews on relevant facts, walking on the streets, taking photos, chatting with people, brainstorming, mind mapping, interviewing, focus groups, visual research, site research.	Intuitive, informal, and formal, explorative, connecting with organization's culture and context and audience's culture and context	Yes	Yes
2. Definition	Identification, categorization and transformation into significant features or requirements within a creative brief.	Rational and intuitive, formal, leading to criteria	Yes	Yes
3. Creation	Search on previous art and design works; creative techniques; sketching in an iterative process	Design thinking, intuitive, informal and individual and collective search	Yes	Yes
4. Develop	Prototypes, evaluation of ideas, participation of stakeholders and audience; search of technology, materials and processes	Intuitive but more formal and objective	Yes	Yes
5. Implementation	Search on materials, production processes and the transference methods,	Formal and informal, assessment and supervision	Yes	No
6. Evaluation	Quantitative and qualitative: measure and evaluation of results and impact	formal and informal, deductive and intuitive, subjective and objective.	No	No

Canadian and Mexican Backgrounds

UASLP student participants' previous experiences were basically related to drawing by hand. These skills identified designers and designer's way to explore and develop ideas and solutions. These activities involve not only developed drawing abilities but also critical thinking and engagement that represent actual strength connecting design with research. I identify the relevance of visual skills among these students that support education and promote research methodologies of design based on visual modes of enquiry. What I suggest regarding this issue is to enhance research learning by using instructional strategies that involve visual skills and

sketching ways of exploration and analysis. All types of graphic tools for analysis, including various mind maps and sketching should be assigned by educators and practiced by students.

Concordia students commented how they like using computers on a daily basis. In this sense, Canada shows strength in this field while in Mexico computers represent at this moment a challenge and limitation for UASLP student participants. Technology represents a dynamic instrument that is evolving and transforming design in a very complex manner, not only communications, but also the ways of learning in the design studio and across this comparatively new digital culture. This transformation of graphic design requires mastery of communication technology both in Mexico and Canada. These issues represent a challenge for educators, who are asked to be up to date with technology skills and innovative strategies in education.

UASLP faculties have unidisciplinary background, which means undergraduate and graduate studies in graphic design, while Concordia educators have multidisciplinary education backgrounds that include English, Communications, Industrial Design, Architecture, History, and Photography, besides Graphic Design. The unidisciplinary background of UASLP educators promotes a deep understanding and involvement in graphic design with an exclusive perspective, while the multidisciplinary background of Concordia educators, influences design education with a broader understanding of contemporary and complex communication problems with an inclusive perspective. The exclusive perspective of design represents an education that looks only at design intervention as solutions to problems, while an inclusive perspective of design represents an outcome of having an education that looks for diversity in areas of knowledge and solution to problems.

A relevant finding was that the diversified background of educators not only contributes building a comprehensive perspective necessary in the development of significant design

proposals, interdisciplinary and collaborative projects in the design studio as well, but also in the understanding and enrichment of research methodologies supporting the design process. With this finding I suggest building design schools' faculty with diverse professional and education backgrounds of educators and coordinators as a means to expand the many ways research can be integrated with design.

Graphic Design Definition

Functionality has been a valued commonality of design for all participants. Functionality of graphic design involves reaching audiences, calling attention and connecting, facilitating understanding, encouraging and persuading people by adequate forms but most of all, effective communication. Even though, Concordia educators have added aesthetic principles saying: "Design is not only functionality; it is also the aesthetic dimension" (Racine, personal communication, April 4, 2013) it is communication which provides adequate balance between function and aesthetics. Buckminster Fuller (2014) has written, "When I am working on a problem I never think about beauty. I only think about how to solve the problem. But when I have finished, if the solution is not beautiful, I know it is wrong" (p. 94). This is to say, beauty is necessary to be functional. Research practice supports both functionality and aesthetics since data collected involve these two dimensions of design and contributes to a suitable balance. In this sense, UASLP and Concordia student participants have shown a relevant difference. Concordia student participants connect design with art; at Concordia University art permeates design with its philosophy, aesthetics, history, and research methodology while Mexican students connect design with design itself, with its philosophy, aesthetics, history, and research

methodology. Arts, design and communication perspectives have different impact on research in the design education curriculum and even pedagogic models used in design studio courses.

Comprehensive and integrated concepts in research methodologies for design can be reached by an exchange and interaction of universities coming from these different streams of philosophy and background. It is necessary to be aware of that situation, of one's own perspective, the strengths and weaknesses of each stream and at the same time maintain an open attitude for interaction that may enrich and improve methods and techniques of design education and research.

Graphic Design and Society

Student participants have stated that graphic design connects the user to people, things, and ideas as a dynamic interface, changing user's' mind and behaviour. The main contribution of design activity is providing social change. Design and society experience a dynamic relationship that needs to be updated constantly by designers through permanent feedback or acknowledgement of changes in society. "Design is shaping the world in the way we live, design influences our behaviour; it influences our way of being" (Racine, personal communication, April 14, 2013). With that responsibility of affecting society in a variety of ways, professors should make students aware of what is best for people and the environment, promoting an ethical vision of what should be improved or transformed and an awareness of the kinds of impact produced by design on the community.

Educators from both cases have explained that design generates culture, identity and communication in educational, social, cultural, economic, democratic, health, and job contexts. The complexity of all these areas of work requires suitable, creative, and reliable approaches of

investigation in order to understand the specific community's needs or problems to be solved. These are the principles that guide design research, to update understanding of society's needs and possibilities. These principles should guide design educators to promote effective and innovative research methods. One of these methods mentioned by UASLP educators is immersion.

Immersion needs to incorporate education and management, as well as a strong research base, getting effective approaches to the community. Suitable immersion in the material culture, looking for tracks of shapes, colours and words, develops the ability to read and write in that culture (Cross, 2007). Moreover, professors explained that community-based projects addressed in design studio courses represent a practice that not only provides engaging and challenged problems to students, but deeper and complex possibilities of exploring research methodologies of design. So, the community represents the educative environment in which to develop research skills, as well as the field to broaden and identify design contributions and possibilities. In addition, communities are growing in complexity and require effective, economic, and innovative methods of research from designers. These ideas bring up the designer's education to master research skills either formally structured and planned or informally improvised for the purpose of understanding the scenario and the problem. Thus, diverse research strategies need to be promoted in design studio practice in a more consistent way. Students need to understand that "design is research and research is design" (Richman, personal communication, September 14, 2013).

The dynamic interaction and influence between designed objects and their users bring up ethical concerns that Canadian case participants have shown in their data, "design gives us both the power and the responsibility to communicate with society" (Richman, personal

communication, September, 10, 2013). Communication also grows in complexity requiring from designers enough knowledge of research methods in order to get necessary information about the multiple elements that intervene. Both groups of educators have stated that communication is the most important component of graphic design, which requires deep reflection on design responsibilities and orientation towards social problems and needs. Communication is the main instrument of graphic design by which intent to change people's mind, attitude or behaviour. Educators' understanding of the role of communication in graphic design contributes to research-for-design, guiding design processes with the aim of producing effective communication strategies. These strategies are based on awareness, knowledge, creativity, empathy, and experience about the community that needs to be explored in the design studio, as criteria guiding students with their projects and the research methodology, exploring users and design interactions.

Observation

Student participants in both cases have expressed that observation is the primary means of exploring, investigating and analyzing. They have described how they get to know the topic by looking at images through informal ways of investigation. These observation skills are valuable methods of data collection with which students feel comfortable. Malouf (2011) explains: "Learning in the studio is not accomplished through pedagogical demonstrations, but is rather achieved through student observation and enquiry" (p. 101). Educators facilitate instruments and methods to observe and to analyze in each stage of the design process using visual tools according to the type of needed data, developing students' observation skills and enhancing the learning experience. Pimienta (2012) explains that "teachers with wide repertory of suitable graphic organizers can provide them to students. These strategies are innovative and effective,

since they help to organize data in personal ways promoting self-learning" (p. 23). I find there is too much to explore regarding visual research, so learning strategies of research must lead observation exercises to focus and empower skills of discretion. Design studio courses should explore more of this component of research through the systematization of visual methods adapted to each project scenario. It represents a challenge starting with necessary training of educators on the uses of graphic organizers as research and analysis tools where images may substitute words in representation of thoughts; used by students developing a concern for a comprehensive understanding of the milieu in which design takes place, guiding suitable exploration of social and cultural contexts.

Questioning

Questioning is an important technique for research, reflection, and critical thinking. Educators explained that posing questions can be the starting point of research in the design process, by raising all the questions related to the problem: who, where, what and why (Racine, personal communication, April 4, 2013). "Enquiry means to discover, show interest, be motivated, problem find, problem solve, think, and create meaning" (Delcourt and McKinnon, 2011, p. 1).

Questioning accompanies each step of the entire design process. Posing questions should be mastered by educators for the adequate guidance of students' exploration. Educators in both cases have shown experience with methods of enquiry, and directing students' understanding of the design scenario problem. Triggs (2011) explains that: "Design thinking and critical thinking practice should form the basis of how we approach contemporary social and economic challenges" (p. 125). Moreover, questioning connects with reality facilitating ethical and sustainable responses. But in order to make this as an effective practice, it is necessary to reflect

on students' educational practice looking at what the community is asking of designers and what designers should be contributing to improving society's quality of life.

Comprehensive Thinking

Students of both cases have shown an awareness of the complexity of social and commercial problems that requires comprehensive solutions. Students have listed the research requirements for a design project such as: client and background, audience and their cultural, social, economic, political and environmental contexts, as well as competitors in the market. The role of research-for-design is crucial for a comprehensive understanding of the emergence of new design scenarios in complex societies that are always evolving and fragmenting. Moreover, students have described contemporary features of research-for-design in terms of functional, creative, innovative, efficient as well as economical goals that demand an integrative exercise in design. They explained that good design can be reached with agility mastered by practice, by continuing the exercise of research. Because of this, research needs to be promoted from the first courses of the program through the final courses of advanced levels.

Iterative Process

The iterations represent designerly ways to develop a solution based on repeating the process: creation, evaluation and redefinition (Cross, 2007). The non-linear and organic features of iterations in the design process are actually seen more consciously. Educator participants at design studio courses consider iterations as an effective educational experiences and opportunities in the promotion of multiple ways of doing research. The iterations represent not only a way to develop a designed object but also an educational strategy that involves research and the opportunity to reflect on the role of research in design.

Informal and Intuitive Research

Educator participants from both cases have placed emphasis on informal methods of investigation in a wide variety of ways such as serendipitous, undocumented, pragmatic research by asking questions, interviewing professionals of design, talking to people who know about the scenario beyond design, and allowing creative and personal ways to explore the scenario (Moore, 2013; Racine, 2013; Yanez, 2013). That practice can include, internet and social networks, user approach, visits to scenario sites, getting "enough" information, conviviality of sharing activities, places and people, and evaluating the proposal by using it (Macedo, personal communication, May 15, 2013; Press and Cooper, 2007). Informal methods of research open up in students the aim to explore and obtain information from diverse sources allowing intuition to lead the data collection and enhance creativity and innovation. These methods are accessible to students and with which they are comfortable, that empower personal ways of knowing and exploring, strengthening the design students' abilities and dispositions about research. To create an academic institutional change in graphic design education requires starting with necessary training of instructors and strategic shifts in curriculum.

Collaboration

Concordia educators have explained that approaching stakeholders and communities through dialogue and collaboration influence students, personal learning, develops social skills, enhances sensitivity, makes students familiar, responsive, and even attracted to people and networks. This is a strategy based on connecting, interacting, and exchanging; promoting among students an open attitude to the real world that empowers problem-solving skills. Research empowers students establishing suitable connections and being able to create and facilitate the dialogue with the client and stakeholders, and become that source of communication and the intermediate

between the user and the producer (Richman, personal communication, September, 10, 2013). Students become able to create a dynamic team with stakeholders and facilitate the exchange of knowledge and experience that favours effective solutions to design scenario problems. This idea of collaboration shifts the design activity from an individualistic practice to a team and interdisciplinary endeavour with a perspective of broadening the intervention of people outside of the discipline. This includes graphic design looking beyond the constraints of the discipline to participate, collaborate and communicate with other fields of enquiry.

Empathy

Student participants from both cases have commented on the relevance of knowing users and users' context. Even though an inclusive perspective of the user may need a full revision of the curriculum, content and teaching strategies and instruments in design studio courses. According to what participants have shared, practices that focus on users, express critical weaknesses in research-for-design. Students assume a lot regarding the critical issues of users that are not revised adequately through research. Effective graphic design, which contributes to society, must be based on understanding users. Students are not used to go and talk to people, but once they realize the benefit of doing it, they get different and enriched perspective of problems. A UASLP student participant discovered that people think differently than designers once they did the research (Barrientos, personal communication, March 11, 2013). Understanding people require taking students out of the classroom, approaching their communities, through effective immersion, with creative methods of research that have been and are yet to be established.

Research in the Design Process

In this point, I have set participants comments about the role of research in each stage of the design process following our initial model that includes six stages: exploration, problem definition, visual research, creation, implementation and evaluation.

Exploration

Porter (2008) distinguishes this stage from 'investigation' and describes exploration as "data collection, statistics, pols and surveys, relevant techniques among others in order to identify the features of the situation to be addressed" (p. 174). A conflict with the term *investigation (investigation)* has emerged in both institutions and indicates a major breakdown in communication. Educators from both cases have related the term investigation, first as exclusive to the stage of Exploration (Dumond, personal communication, May 10, 2013); and second as formal, structured, and complex as scientific research that somehow does not match with the design process. This misperception is an imposed requirement of academics at postgraduate levels, and produces negative impact on the perception of research and design practice (Bonsiepe, 2007). An educator participant from UASLP is making efforts to promote innovative ways of research: "by experiencing new ways of doing research, we learn that there are many different methods of research, by many tools of data collection we improve our approach to people" (Monjaraz, personal communication, March 14, 2013), and improve designers' responses. The clarification of what is research-for-design in design studio courses is necessary. For this purpose, clarifying the concept of research-for-design I have found some principles from participant responses: The first principle coming from Concordia educators is: "Design is research and research is design." It should be a mandate to associate them. The second principle, the designer is the researcher and needs to be aware and prepared for research. The third

Table 24

Summary what Research-for-design is and what is not

What Research-for-Design is and what is not	
Is	**Is not**
Exploration	Recipe
Nonlinear path	Linear path
Observation	Imagination
Listening	Talking
Questioning	Inventing
Search	Relate
Evaluate	Repeat
Verify	Copy
Discover	Infer
Compare	Determine

principle, main subject of research is the user, designer must focus. The fourth principle, purpose guide the method, let's be creative. The fifth principle, it is necessary to get trustworthy and comprehensive information for what it is necessary a wide source of data. The six principles, data collected needs to be registered and organized. The seventh principle identifies main concepts of the scenario. The eighth principle apply those concepts in the proposal. The ninth principle assesses the proposal to look at the purposes.

Problem Definition

Problem definition is a reflective moment, setting frames for concepts and spaces by structuring and formulating the problem, setting objectives and personal perspectives to address the problem necessarily for the creative stage. Nevertheless, student participants have explained how they

start sketching before the problem definition is completed. This relevant feature of design practice requires understanding of educators facilitating diverse kinds of exploration among students. Even though, educator participants in both cases have emphasized requiring students' comprehensive data collection and analysis of the problem with the aim to reinforce the intellectual foundations of problem definition. These actions represent actual ways of research-for-design, exploring and understanding the problem through the solutions that emerged before the creative stage. The nonlinear, iterative and solution-led nature of design brings opportunities to explore research practice and experience it in a more conscious and creative ways. Educators facilitate exploration of proposals with flexible and innovative methods like Participatory Design or Contextual Design (Press and Cooper, 2007), that involve stakeholders and users, in a back and forth process as described by Concordia educator participants. Research helps students to articulate clearly and coherently their objectives, so they can link initial intentions with final results (Racine, personal communication, April 4, 2013). This is an educational device connecting theory with practice as well as guiding the creative and evaluative stages.

Concordia educators have explained that problem definition includes conceptualization as an outcome or response of the designer that involves critical thinking and synthesis of data analysis, as well as rational and intuitive mental processes (Moore, personal communication, June 14, 2013) in dynamic interaction and interdependence. It also involves the generation of proposals, explanations, testing and defending ideas using both inductive and deductive strategies through problem solving, history investigation, invention, experimental enquiry, and decision-making that represents the highest skills to develop in students (Marzano, Pickering & Pollock, 2001). Suitable conceptualization represents the connection between research´s outcomes and the response of the designer. Even though, educators from both cases have

commented that there is a weakness on how to apply in the creative stage what has been found during research. So, they seem to be separate things (Monjaraz, personal communication, March 14, 2013). It is necessary to guide students in the effort of connecting the findings of research with the design concept through conscience and intertwined ways, to build bridges between the problem definition and objectives with the solutions.

Visual Research

Student participants have described visual research practice to get situated and inspired in order to find relevant information by observing and analyzing previous designs related to the problem; analyzing typography, colour, technique, word expressions, concepts, preferences, trends, and even how the theme has evolved as a way to understand communication means and then building on top of that (McDonald, Personal communication, April 24, 2013; Rodriguez, Personal communication, March 28, 2013). What is relevant in this study is that this kind of research represents the main means of exploration, excluding any other method or subject of research. Therefore, educators in design studio courses need to promote visual research not only of previous designs but also exploring, visiting, looking, identifying, selecting, categorizing, organizing, structuring, representing, synthesizing, and diagramming among other visual activities opening up students' mind to variety of possibilities and situations, connecting with the real world. Furthermore, educators should promote visual research incorporating qualitative approaches that enable adequate apprehension of cultural and social meanings, critical in the understanding of users and contexts (Frascara, 2008).

Creation

Educators from both cases explained that the creative stage of the design process includes sketching, revision, refining, and use of mock-ups, selecting and arriving at the final proposal in

iterative manners by rational and intuitive ways of thinking. Educators in both cases have connected with these concepts, since they guide students in the evolution of solutions accompanied with the evolution of the understanding of the problem in a conscious way by applying research practice. UASLP student participants explained that creative processes need to involve research as interdisciplinary work with stakeholders, professionals, professors, specialists, technicians, salesmen, as well as researchers, sociologists, psychologists, educators, among others (Pardo, personal communication, March 26, 2013). This interdisciplinary practice broadens students' possibilities and expands their understanding of design, and enhances creativity by opening up to diverse of ways of thinking, the diversity of arenas affecting design and comprehensive understanding of the problem and contexts (Porter, 2008). So, professors may guide students in the approaching of people and stakeholders, building their communications and interpersonal skills for research. Ultimately research-for-design needs to remain focused on creative outcomes, the fluidity and flexibility necessary to be creative, all the while maintaining a clear and concise message as a final outcome.

Implementation

Implementation processes and techniques of reproduction require knowledge of materials and technical systems that involve sustainable concerns. New objects, new means of communication, new materials and technology appear and affect society with ethical and sustainable issues. Concordia participants have explained that designers have the obligation to think in terms of the life cycle of each piece of design and its trajectory in an elastic way, before and after production. In this sense, Concordia educators have explained how to embed social and environmental concerns into assignment requirements to accommodate students' interests, as well as to provide pedagogical links to sustainability (Bertling, 2015). Canadian participants exemplify sustainable

practice of design, having specific institutional, social, and environmental norms and developed personal criteria for ethics and sustainability issues. Concordia educator participants recommended enhance the skills to predict and visualize the interactions between object and people, and environment and other objects.

UASLP participants have presented a poor body of data with regard to the design implementation. This situation shows an opportunity for improvement in this area. One relevant example is sustainability where Mexican case can learn from the Canadian case not only with regard to the life cycle of a design product and the environmental impact that results, but concern to social equality and culture respect.

Evaluation

The Evaluation stage also represents a critical practice of education in the design process. Educator participants have explained that evaluation should assess the impact of the designed object on the user and on the context. Students should use suitable instruments of evaluation, based on the purposes established in the problem definition stage. And that involves specific research activities of measuring and contrasting, where students identify and reflect on design contributions, connecting initial intentions with final results (Racine, personal communication, April 4, 2013).

How to Improve Education of Research-for-Design?

This point is central to my study objectives. Here I have described ideas, perspectives, and best practices in teaching and learning of research-for-design in areas in which educator and student participants have provided for this comparison.

Outlining Instructional Strategies

Concordia educator participants have explained that it is necessary to plan adequately the instructional activities used in design studio courses (Moore, personal communication, June 20, 2013). Research represents the ground of any teaching strategy in the design studio courses such as Problem Based Learning, because it sets research as an educative means. Educators need to plan ahead for topics, stages, activities, possibilities and opportunities students may experience along the design process.

One fact to consider is the name used to call the project. Student participants and educators from UASPL use to name projects saying ‘theme’, ‘topic’, or ‘project’. These names may influence the students’ attitude as they approach and engage with the scenario. Moreover, the name of the project may influence the way students become involved with research. Concordia educators used terms such as “initial idea,” “initial objective,” or “scenario” integrating users and context. These terms suggest an open response of a variety of solutions and strategies, going further than problem-solving, facilitating deeper approach of actual research practice. Organizing and planning the cases by educators should incorporate the way of naming the project and setting objectives, expectations and possibilities, in order to create the suitable learning experience from the project’s inception.

Institutional Design Methodology

Methods of design are valuable educational strategies guiding students in the understanding of design practice. Student participants from UASLP have expressed how they appreciate having a guide for the design process. Following a design methodology informs educators’ pedagogy and lends institutional experience to promote confidence, curiosity and passion; it will also develop students’ perspective, skills and abilities, developing personal design and research

methodologies. An institutional methodology serves as a historical memory providing continuity while promoting new ways of doing design with social and sustainable perspectives. All the while, this methodology allows educators to prepare students to adapt to new contexts and contemporary changes facilitating self-learning as well as responsiveness to others. At Concordia University design methodology is promoted by educators' individual design philosophies. Individual methodologies allow the development of personal and creative ways of doing design. The design methodology as a comprehensive system at institutional level has been recommended by all UASLP educators in this study, as a unifying strategy to guide students (Villalon, 2013; Yanez, 2013; Martinez, 2013). This institutional ethos is at the core of the UASLP program, setting common values and principles as an educational community that permeates all members in the short, medium and long term. Any methodology of design will facilitate the integration of theory and practice in the design studio in a coherent and easier manner for students to comprehend, since they start assimilating design practice in a structured, clear, and engaged way from the very first class.

Balance Between Creation and Research

According to Concordia educator participants, "avoiding research overtaking creativity" (Carlisi, personal communication, April 24, 2013) explains that design and research should be done in simultaneous series of iterations. This is not only a motivating and educational strategy to follow, it is necessary to understand the co-evolution of the problem solution as part of the design method (Cross, 2001; Daalsgard, 2014). How educators guide students and instruct research in the iterative style, in a conscious back and forth manner, establishing parallel movements of research, and design has yet to be fully investigated but remains clearly relevant to

research-for-design. The potential to use this praxis of design and research, encourage independent learning and research skills as an effective and emerging strategy.

Student Engagement

A UASLP student participant has expressed how she appreciates the liberty for decision-making within a given methodology (O'Farril, personal communication, March 18, 2013). In tandem, educators have commented how students develop personal ways of visual research, classification and organization of data in a diversity of ways for analytical reflection, while adhering to the program's methodology. Related or unrelated to the methodology, these actions enhance student participants' critical thinking and facilitate approaches to the design problem by describing, interpreting, associating, distinguishing, contrasting, differentiating, and discussing the problem from the one's own perspective, and making associations with their personal knowledge bases, strengths and interests (Yanez, personal communication, March 18, 2013). These tools of investigation and analysis are embedded in the UASLP methodology.

The methodology provides a scaffold for learning that encourages the formation of students, and the structure allows personal exploration of research and design skills in a manner that is consistent with Constructivism. The development that students experience with the guidance of UASLP's Design Plan allows further motivation, involvement, and understanding of their role and contribution to society as designers. UASLP constructivist perspective would improve by moving to social constructivism. This would facilitate getting closer to the community not only for educative purposes, but to enhance the designer's contributions to society. By connecting the curriculum, students and scenarios with students' interests and strengths, educators should provide possibilities and opportunities to improve design education, and to redefine the design profession of the future as well, which begin to leave the realm of

constructivism and edges to student-centeredness and social constructivism.

Motivation

A Concordia educator participant has explained how sensitizing and inspiring students promote positive attitudes and desires to go deep, to go beyond, to learn more, and acquiring the disposition for research (Racine, personal communication, April 14, 2013). The attitude and self-motivation represent the engine for research. A Concordia student participant has explained that research keeps her updated and her mind active. Motivation represents a sense of success in education that instructors take into account mostly in the beginning of the design process, by including interesting topics and stories, using videos and images. When students buy into a project from the beginning, success is most likely ensured. Motivation represents a challenge for educators in contemporary educational contexts at undergraduate levels.

I believe that suitable features of research-for-design that allows creativity and innovation, facilitates not only an understanding of what research does for design, but may get as a habit into design students' ways of design.

Real-World Experiences

UASLP student participants have shared memorable learning experiences with real approaches to scenarios. They have shown preference for real projects, which enhance the construction of knowledge structures and help them to develop research skills, through an integral interest in the social dimension of experience, that shapes specific ways to know and discover. Real problems are engaging approaches promoting creativity and innovation, as a way to connect the social and cultural dimensions with the scenarios and giving effective shape to the final solution.

Concordia educators have placed emphasis on outlining instructional strategies when incorporating real problems, providing effectiveness to the learning experience. Agirre (2000)

emphasized the need to use "instructional strategies sensible to the culture" (p. 283). Moreover, innovative strategies should be explored, as scenario-based design proposed by Carrol (2011) as suitable to motivate and guide design learning. Problems Based Learning and similar instructional strategies with the educational principle of experience, facilitates exploration, fosters curiosity, promotes social approaches, and boosts observation from the real world. Those approaches to the real world will broaden students' understandings of their responsibility and possibilities of what they can offer to the community in that unique perspective of design.

Effective Use of Mock-Ups

Concordia students and professors have emphasized the use of mock-ups as one of the most relevant tools of exploration, experimentation, development, and evaluation of proposals. Prototypes are based on representations of ideas and the iterative development design process. This process may involve, according Diaz Barriga and Hernandez (2010) activities such as description, argumentation, contrasting, improvement and evaluation as a pedagogic model, representing the activities of the iterative process. These research activities facilitate dialogue and collaboration with clients, require the revision of pursued objectives, and help to evaluate social, cultural, economic, political, and environmental aspects of design.

Concordia participants recommend the use of models, prototypes or mock-ups in an extended manner in the exploration of effectiveness of a proposal but also as a way to approach the user and the efforts to understand their needs and aspirations.

Collaboration Among Educators

Collaboration among educators helps to develop effective learning communities, coherent and engaging environments for research, strengthening understanding and practice of research for design for an entire program. Concordia students have referred to collaboration among

professors that enhances instructional strategies; and UASLP students recommended this collaboration to provide coherency between design studio courses and the rest of the program. Design studio courses produce communities of teachers who permanently collaborate in planning tasks, strategy development and evaluation. Collaboration and teamwork have an impact on the whole culture and ethos of the faculty and the institution. Collaboration facilitates exploration of instructional strategies incorporating innovative ways to promote research practice as a community with an impact on the curriculum, and instructional strategies strengthens coherency, creates a positive learning environment, and shapes the ethos of the institution.

Connecting Theory with Practice

Educators in both institutions have expressed the difficulty to connect theoretical courses based on research to design studio classes. Research needs to be taught with better integration of research seminars within design practice (Richman, personal communication, September 14, 2013). Design studio environment facilitates students' dialogue, exploring, experimenting, and assessing ideas when educators bring research theory to practise. According to educators from both cases, theory class is the right place to teach how to do research, and design studio class is the place for practice, even though, it is necessary to include more critical, integrated and applied to think to the actual design process (Monjaraz, 2013; Martinez, 2013; Richman, 2013; Racine, 2013; Dumond, 2013). Students need to connect the information and insights gathered through investigation to their proposals and concepts. It is not a matter of balance between theory and practice, but the interactive educational strategy of interwoven ingredients helping students to understand research theory by doing and discovering by themselves (Gedenryd, 1998). Those abilities represent advance skills of research that should be developed throughout the whole

program and taught from the initial stages of the program. In this sense, both institutions present positive actions exploring the integration of theory and practice of research.

Communication

The UASLP educator participant Yanez (personal communication, March 18, 2013) has placed emphasis on the need to improve and deepen the theory and practice of communication in design programs. Functions of design are based on communication. Thus, the content of a program's curriculum should incorporate more strategies from communication across all stages of design regardless of the model being implemented. Scenarios for projects in design studio courses should involve more communication practices. Contemporary evolving contexts of technology situate communication in the praxis of research and design and create a mandate for the use of research in education.

Evaluation

When discussing evaluation of design, this study is not looking at the grading system by which an educator ranks or appraises student work, but rather the quality and influence of research on each stage of designing. When the student has information about the user, they can create a feedback loop between their intentions as a designer and the perspective of the user. More qualitative information than merely the demographics of the user comes into play. The designer must collect information on the milieu in which the user resides. This effectiveness of scenario comprehension informs the functionality of a given design. If research is done well from the beginning, the designer can proceed with an effective iterative reflection between research and design. If the designer reaches a conflict during one of these iterations between the research and the design problem then he or she may need to revisit the research process and gather more information, in order to meet his or her objectives.

Final evaluation of designed proposals must be done in tandem (functionality and aesthetics) by the user interaction with the end product and are the most important part of the evaluative process.

Benefits of Research Practice at Design Education

Research represents educational opportunities to transform design practice into a more exciting, challenging and most likely activity. But more relevant are those skills that shape design students to address the evolving, complex, ethical, and sustainable requirements of contemporary society.

Empowering Critical Thinking

Participant educators have shared how research practice impacts students' performance empowering and developing skills like discussing, interviewing, dialoguing, questioning, and becoming open and flexible, independent and creative, as well as specific attitudes and dispositions (Baum and Newbill, 2010). Research practice facilitates learning from previous experiences, promotes collaboration, and encourages students to participate in a broad vision of sustainable, comprehensive, integrative design. In this sense, critical thinking is instrumental in both research and design, and it needs to be mentored and modelled by instructors by visual thinking strategies. Critical thinking represents a topic that merits further investigation. Even though, this paper looks specifically at who, what, where, when, and how research-for-design is conducted. It does not look at the phenomena of how students engage with research data for design on a more cognitive and critical level.

Comprehensive Approach

UASLP participants have stated that research allows a comprehensive approach to the scenario including historical concepts, social context, meanings and related symbols, colours, images, and

terms providing foundations from which to design. Research practice promotes integrative thinking, contributing to understanding end users, context and design responsibilities established with the client and as well as the possibilities of conducting research out of school and out of the discipline, to attain the outcome of enhancing the scope of graphic design's reach.

Interdisciplinary and Collaborative Practice

Concordia educator and student participants have emphasized that research practice facilitates an interdisciplinary perspective, incorporating stakeholders, professionals, researchers and community participants, producing effective outcomes, dynamic interaction, collaboration and dialogue between designers and the community. These are also requisite for research practice. So, research practice contributes to the formation of students through teamwork, interdisciplinary investigations and communications, which in turn open minds and establish collaborative attitudes.

Interaction with Client and Users

UASLP student participants have described how research practice improves students' personal communication skills, facilitating and promoting an effective interaction with clients, promoting dialogue, understanding, and collaboration. Dialogue with a client and stakeholders not only provides relevant information, but also motivation and sensitization, because real approaches to people open up to other kinds of thoughts and different perspectives. Research facilitates updating social and cultural contexts and their evolution. Through interviews, surveys and pols students identify audience preferences, interests, expectations, and needs. Designers can get feedback from users along the design process, from the first stages of problem definition, to creative processes, as well as at the end, assessing the impact of resulted interactions between

users and the designed object. Research not only lends credibility to the designer's vision and voice, but also adds value to the product that she or he produces for the client.

Career Development

Concordia educators have expressed that research helps designers to implement projects which are comprehensive, masterfully executed, and connected with the user's needs and context in which the user resides. It helps the designer to become a communications strategist and interact with the community and stakeholders, keys of professional practice, showing wider horizons for development. Educators have emphasized that research helps to produce higher quality outcomes: more informed, richer, with refined concepts, and better proposals, that make projects become sustainable. Research provides balance between rational and emotional response of designers. It also provides a wide diversity of design applications and job opportunities as students take the chance to explore their own resources and skills. Research develops the quality people are expecting from designers, such as: innovation, reflexivity, adaptability, and imagination having a unique perspective of the world. Moreover, research skills help to validate designers' contribution to people's everyday life in a sustainable manner.

Self-Development

Student participants have expressed that their whole professional life gets richer with all the information coming from research, learning not only to design but also, how to inform design and evaluate the results of this creative practice. Research helps young designers to become more confident, more assertive, more organized, more logical, and even more outgoing. It also helps provide support for their intuitive decisions. Moreover, research improves how they relate with other people in all facets of their life both professional and personal. UASLP educator participants have commented that students develop and control their own learning processes,

promote self-learning and identify their own possibilities and skills by research practice. Research generates knowledge, education, imagination, and students' critical thinking. By doing research students learn different ways of approaching the community, they distinguish themselves from others, and research facilitates having a unique perspective of the world. The skills and perspectives that designers develop through research practice will allow them to take on leadership roles in all kinds of professional contexts. This leadership will impact social, economic, political and ecological levels contributing to the future of Canada and Mexico.

Limitations of Research-for-Design Education

Through this analysis, I have identified diverse kinds of limitations. Certainly design studio courses as educative environment have limitations. Design studio courses are an educational model, which has demonstrated its efficiency, used in most schools of art and design, with variants.

According UASLP educators, real practice of research at design studio courses is limited; planning and outlining real projects is a complex task that requires educator's creativity and organization. This limitation is substantiated by the finding that students early in their graphic design education need encouragement and direction so as to instigate curiosity and to be sensitized to the issues that require research-for-design. Students adapt quickly to traditional methods of research in order to fulfill educators' requirements, rejecting innovative instructional strategies. When reflection as a form of research on the part of the student is missing, the design process in the studio is left incomplete. Thus, educators have to make an extra effort to promote innovation, creativity, and critical thinking in research. A limitation identified among educators was the approach to professional practice, which is directly connected to real problems. Here time and available resource sites become a nearly insurmountable problem. Educators have to

have time to build networks across the professional design industry and other areas of commerce and social organization in order to create real world sites of investigation. Time is limited on the part of the educators and professional sites of research have their own delineated priorities which are hard pressed to accommodate learners.

Conclusions

To conclude, this study has identified the features of research-for-design: intuitive, informal, spontaneous, innovative, visual, creative, human, and capacity for empathy; characteristics that will enhance the role of enquiry of the designer. This role enlightens educators to see how research contributes, through diverse forms, in all the stages of the design process. This understanding will facilitate the integration of instructional strategies based on research in design studio courses.

Research practice impacts students' performance empowering and developing skills like discussing, interviewing, dialoguing, questioning, and becoming independent and creative, as well as fostering specific attitudes and dispositions. Research practice facilitates learning from previous experiences, promotes collaboration, and interdisciplinary work. It encourages students into participating in a design vision of ethical, sustainable, comprehensive, and integrating practice with broader scope. Research also represents the main way to update and suit design to contemporary contexts and technologies and projecting to future scenarios.

Educators teach and promote research-for-design and they have described creative instructional strategies engaging students, as effective stimulus for exploration and collecting necessary information that provides support for decision-making, based on ethical and sustainable criteria. One relevant finding is the fact that not only is design research and research

is design, but also research represents relevant means and strategies for education of design. Research represents the activity guiding design's pedagogical strategies to develop critical thinking as fundamental to forecasting skills of future professional designers.

As a researcher, this investigation has led me to new questions in the field of design education. Some of these future enquiries do not stray far from the original question of how research-for-design may shape graphic design education. Others look further to future applications of this profession. With regard to the dilemma of making design studio courses into more applicable scenarios to current real-world scenarios, I ask: What kinds of research practices would facilitate real world connections for students and educators? How can research practices can improve the understanding of users? How to develop sustainable and ethics perspective on students through research-for-design? What skills will designers need to develop for interdisciplinary work? How can research facilitate interaction with other disciplines? How to suit research-for-design to contemporary scenarios such as the internet and online commerce as well as political discourse? How does one harness communication technology for visual research? How to extend the participation of designers in decision-making processes? How to improve evaluation processes in the design studio courses?

At the same time that I have been doing this research, I have had the opportunity to apply and experiment the findings through my teaching at the University of Ciudad Juarez. As an example, I have promoted interdisciplinary work, collaborating with programs such as journalism, nutrition and interior design. These experiences have brought an expanded learning to students with new challenges, new methods of working and communication. Through approaches to the real world and social projects, students as agents of change, have expanded their perspective of possibilities and responsibilities as designers. It has open students' eyes and

interests on their community. Intuitive and informal data collection has taken away students' "fear of doing it wrong," focusing on understanding and learning. Familiar and self-directed projects have facilitated the understanding of research methods and developed individual strengths and skills.

I have promoted research-for-design, not only in design studio classes, research classes, and graduation projects, but related courses such as perception and colour, where students have developed approaches to research in an easy and innovative way, getting immersed on their community, obtaining wider and comprehensive data in an unexpected way. I have experimented with how students value the insight of better understanding of users and context, which have improved the connection between research and design, when students develop a more coherent proposal based on the new knowledge of the case.

To conclude, there is a lot of work ahead for design educators to promote research-for-design. The opportunity to update the graphic design profession to contemporary standards in effective ways is presenting itself. Communication and technological advances provide an increasingly extensive field for design contributions, representing emerging possibilities for understanding evolving cultural, economic, and political scenarios through research for design.

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Annexes

Concordia UNIVERSITY

ART EDUCATION
M.A. and Ph.D. Thesis Proposal Form
This is to certify the following Master of Arts/Doctor of Philosophy thesis proposal

By: SALVADOR EDMUND VALDOVINOS RODRIGUEZ

Entitled: RESEARCH-FOR-DESIGN: A COMPARATIVE STUDY OF DESIGN CURRICULA IN CANADA AND MEXICO

has been reviewed by the student's Thesis Committee on Jan 22, 2013 (date).

Results of the Thesis Committee's Review:

☒	Approved as submitted	→	Copy of the proposal.
○	Approved with minor modifications	→	Copy of the proposal and a summary of the recommendations are attached
○	Student is to summarize recommendations and make modifications to be approved by the committee	→	Copy of the proposal, the recommendations and the modifications are attached
○	Major modifications required for approval	→	An additional Committee meeting will be scheduled to review the modified proposal

The student must submit a completed Summary Protocol Form along with this document.

Approval:

Thesis Supervisor		Date	Jan 22, 2013
Committee Member		Date	Jan 22, 20 2013
Committee Member	Linda Szabad-Smyth	Date	Jan. 22, 2013
Committee Member		Date	

UNIVERSITÉ Concordia UNIVERSITY

CERTIFICATION OF ETHICAL ACCEPTABILITY FOR RESEARCH INVOLVING HUMAN SUBJECTS

Name of Applicant: Salvador Edmundo Valdovinos Rodriguez

Department: Art Education

Agency: N/A

Title of Project: Research-for-design; A comparative study of Design Curricula in Canada and Mexico

Certification Number: 30000813

Valid From: Jan 31, 2013 to: Jan 31, 2014

The members of the University Human Research Ethics Committee have examined the application for a grant to support the above-named project, and consider the experimental procedures, as outlined by the applicant, to be acceptable on ethical grounds for research involving human subjects.

Dr. James Pfaus, Chair, University Human Research Ethics Committee

Interviews Questions

Student's questions

1. Why did you choose to study graphic design?
2. How do you define graphic design?
3. What are the benefits that graphic design provides to society?
4. Can you describe your design process?
5. How research helps you in your design process?
6. How do your professors teach you research-for-design?
7. What are professors' attitudes towards research-for-design practice?
8. What can be done to improve your research skills?

Teacher's questions

1. How did you become a designer?
2. How do you define graphic design?
3. What are the benefits that graphic design provides to society?
4. Can you describe the Design Process?
5. How do you teach, promote or support research within the design process?
6. What is the students' attitude towards this research practice?
7. What kinds of benefits do you find in students doing this research?
8. What can be done to improve the teaching of research-for-design?

CONSENT TO PARTICIPATE IN RESEARCH-FOR-DESIGN; A COMPARATIVE STUDY OF DESIGN CURRICULA IN CANADA AND MEXICO

This is to state that I agree to participate in a program of research being conducted by Salvador Edmundo Valdovinos Rodríguez of Art Education of Concordia University (Phone office: 514 507 9697, Cell phone 438 877 9197, Email: s_valdov@live.concordia.ca).

A. PURPOSE
I understand the aim of this study is to understand on how research-for-design is being taught. The researcher is investigating the teaching and learning experiences of teachers and students in design studio courses through interviews.

B. PROCEDURES
I understand that I will be invited to answer verbally to questions asked by the researcher. I am asked to provide an object designed by myself to be photographed, from which I will describe my design process. The interview will take no more than 50 minutes and it will be audio recorded. I understand that I am free to answer each question or to pass on each question. I understand that the interview will be transcribed, and returned to me for review. I understand that I can modify the transcript as I wish, adding and deleting text.

C. RISKS AND BENEFITS
I understand that there are no known risks or harm to me by participating in this research.

D. CONDITIONS OF PARTICIPATION
• I understand that I am free to withdraw my consent and discontinue my participation at anytime without negative consequences.
• I understand that my participation in this study is (please check):
__ CONFIDENTIAL (i.e., my identity won't be revealed in study results)
__ DISCLOSED (i.e., my identity can be revealed in results and/or published material).
• I understand that the interview data and images of my design projects used in this study may be published in the media, including journals, websites, or books for academic purposes.
• I understand that credit of my authorship will be given.

I HAVE CAREFULLY STUDIED THE ABOVE AND UNDERSTAND THIS AGREEMENT. I FREELY CONSENT AND VOLUNTARILY AGREE TO PARTICIPATE IN THIS STUDY.

NAME _____

SIGNATURE _____ DATE _____

If at any time you have questions about the proposed research, please contact the study's Principal Investigator: Salvador E. Valdovinos R. PhD Candidate of Art Education of Concordia University. Phone office: 514 507 9697, Cell phone 438 877 9197, Email: s_valdov@live.concordia.ca
Or you might contact the Faculty Supervisor Juan Carlos Castro, Ph.D, Art Education Department of Concordia University; Internal address EV 2.625 Phone Number 848-2424 Ext 4787 and Email: jcastro@concordia.ca
If at any time you have questions about your rights as a research participant, please contact the Research Ethics and Compliance Advisor, Concordia University, 514.848.2424 ex. 7481 ethics@alcor.concordia.ca