



Universidade de Aveiro Departamento de Comunicação e Arte
2010

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C.GONÇALVES**

**CURRICULA ANALYSIS & STUDY OF DESIGN
EDUCATION; UNDERGRADUATE LEVEL**



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**ANALISE CURRÍCULAR E ENTENDIMENTO DOS
PROCESSOS DE ENSINO DO DESIGN.**



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Dissertação apresentada à Universidade de Aveiro para cumprimento dos requisitos necessários à obtenção do grau de Mestre em Design, realizada sob a orientação científica do Dr. Rui Miguel Ferreira Roda (Professor auxiliar convidado da Universidade de Aveiro) e Dr. Francisco Providência (Director de curso do Mestrado em Design do Departamento de Comunicação e Arte da Universidade de Aveiro).

I dedicate this work to the loving memory of my grandmother Amélia Da Gloria Soares Ferreira who provided me with support throughout this experience.

o júri

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agradecimentos

I would like to take this opportunity to thank all the people that have stood by me, believed in me and supported me throughout this experience. First i thank my family. To my father who i will always look up to, thank you for your support, and words of wisdom. To my mother whose encouraging words and unconditional love have made me a stronger person. To my sister and brother for the patience, support and good humour.

I thank my aunt Marlene who has been a friend, for her helpful contribution to this work, for the advice and encouragement.

I am grateful to my colleagues with who I have shared the good and not so good moments during these past two year.

A special thanks to my Professor Rui Roda, for his guidance and belief in this work and to Professor Francisco Providencia who has always been available and supporting throughout this experience. I thank all my professors who have sheared their wisdom.

I would also like to thank all the correspondent professors for their cooperation and contribution to this work.

palavras-chave

Ensino de design, licenciatura, currículo e estrutura, história, teoria e prática, investigação de design.

resumo

A presente dissertação ambicionou reunir e analisar todo um conhecimento considerado disperso focalizado sobre a *Prática do ensino em Design*.

Em específico, com especial atenção sobre a transferência do conhecimento ao nível da Licenciatura – primeiro ciclo – pretendeu-se observar a informação produzida pelos currículos praticados em diferentes academias de ensino (em Portugal e no estrangeiro) no sentido de compreender a diversidade de abordagens e estratégias adoptadas por cada curso da licenciatura em Design.

Como ponto de partida realizou-se uma primeira leitura focalizada no plano curricular praticado pela Universidade de Aveiro, numa abordagem tendente à compreensão do seu plano curricular, ou seja, como é comunicado e representado ao nível do seu modelo conceptual.

Paralelamente, conteúdos de outras licenciaturas foram igualmente analisados, reunindo um conhecimento representativo de diferentes contextos. O estudo apresentado tentou dar uma ordem à informação dispersa pelos diferentes contextos académicos, naturalmente nutrida pela contribuição de especialistas de excelência, convidados a interagir através de entrevistas, ambicionando uma construção consciente e avançada sobre a lente de análise. O estudo, considerando todas as limitações inerentes à ambição deste projecto, iniciou um olhar sobre a extensa informação epistemológica orientada à prática pedagógica, segundo os seguintes critérios:

- a) dar forma a uma análise comparativa das variáveis relevantes presentes nos currículos orientados à prática do ensino em Design;
- b) reunir a informação dispersa de pesquisadores que actuam teoricamente com o tema – Prática de ensino em Design;
- c) organizar e sintetizar a complexidade da informação dispersa, segundo a prática de ensino na Licenciatura em Design, com o objectivo de promover um fácil acesso à informação útil à comunidade científica local interessada no estudo do tema.

keywords

design education, undergraduate degree, curricula and structure, history, theory and practice, design research.

abstract

This dissertation intends to collect and analyze all considered spread out knowledge focused on the *Practice of Design Education*. Focusing particularly on the transfer of knowledge on an Undergraduate level, the intention was to observe the information produced by the prevailing curricula in different educational academies (in Portugal and abroad) in order to understand the diversity of approaches and strategies adopted by each course's degree in Design.

As a starting point the design curriculum practiced by the University of Aveiro has been employed, in an attempt to understand their curriculum, and how it communicates & represents its conceptual model.

Simultaneously, contents of other degrees were also analyzed, bringing together a representative knowledge of different contexts. The present study attempted to give an order to the wide range of information by the different academic contexts enriched by the contributions from experts who were invited to interact through interviews, in the ambitions of reaching an advanced and conscious construction under the lens of analysis. This study, considering all the limitations of this ambitious project, initiated an extensive look at the epistemological information oriented to the teaching-practice, according to the following criteria:

- a) giving form to a comparative analysis of relevant variables that are present in the curricula and oriented toward the practice of teaching in Design;
- b) collect the wide range of information of researchers who practice theory on the topic – The Practice of teaching Design;
- c) organize and synthesize the complexity of this spread out information, according to the practice of Design Education within an undergraduate level, in order to promote easy access of useful information to the local scientific community interested in studying this issue.

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1 Charter –Introduction

1.1 Delimitation of the Topic-Theme

The theme of this study is CURRICULA ANALYSIS & STUDY OF DESIGN EDUCATION; UNDERGRADUATE LEVEL. It was chosen as a topic of study because of the important role that a well structured curricula plays when approaching design as a discipline. A curriculum affects how the design process is transferred from various and specific sources to the design student. These sources may come in theoretical or practical form, in collaboration with other sources outside the faculty, through research, through individual or sheared experiences. Overall the curriculum is the pathway for students to gain a full educational experience. It may be that in certain regions or countries, Design can be the result of an artistic expression, cultural, technical, philosophical and social; or the summation of all these factors. It is interesting to examine how these differences are expressed and incorporated through the curricula of a series of universities that belong to the occidental world.

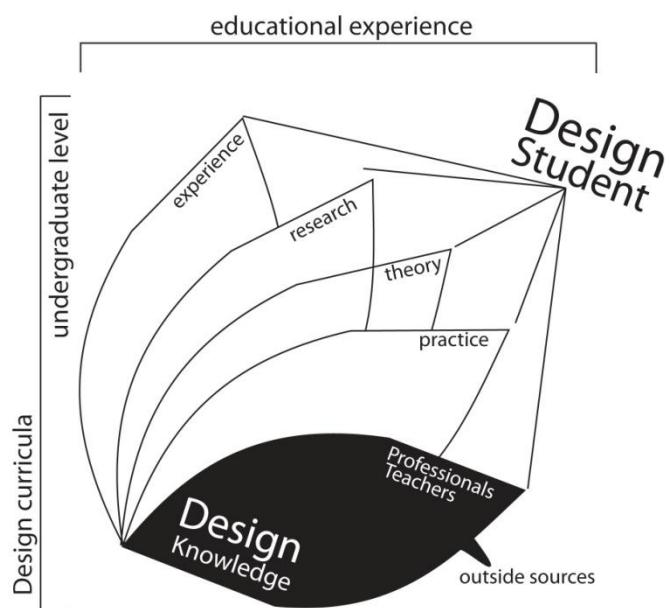


Figure 1.1: Educational Experience.

Source: Natasha, C. Gonçalves.

The specific choice of focusing on the undergraduate level was made because it is the first step in formal education which objective is to prepare a student

for a productive life in our culture, prepare a student for entry-level employment in the profession or for advanced study in a graduate programme. Therefore also being the first formal introduction between knowledge and student that will lead to a specific area of profession.

"Recognise that the design of the everyday world deserves attention not only as a professional practice but as a subject of social, cultural, and philosophic investigation." Richard Buchanan & Victor Margolin (1996, pp.32-33).

1.1.1 Problem- Question research

For most first year design undergraduate students, the design education system may be confusing and confronting. Most are rarely clear about what they have signed up for, and have little idea of what their peers in other design courses are doing. It is particularly difficult for new student's to understand the significance of complex ideas such as expression of culture, identity, and design solutions among others. This is one of the main reasons why it is important for faculty to focus their attention and involvement in to improving design education processes, methodologies and curriculums where questions such as;

- Which are the alternative approaches to design education?
- Can the students learning process be facilitated with a well structured curriculum?
- How can a curriculum support the development of a broad understanding of the fields of art and design in response to contemporary trends and conditions in education?

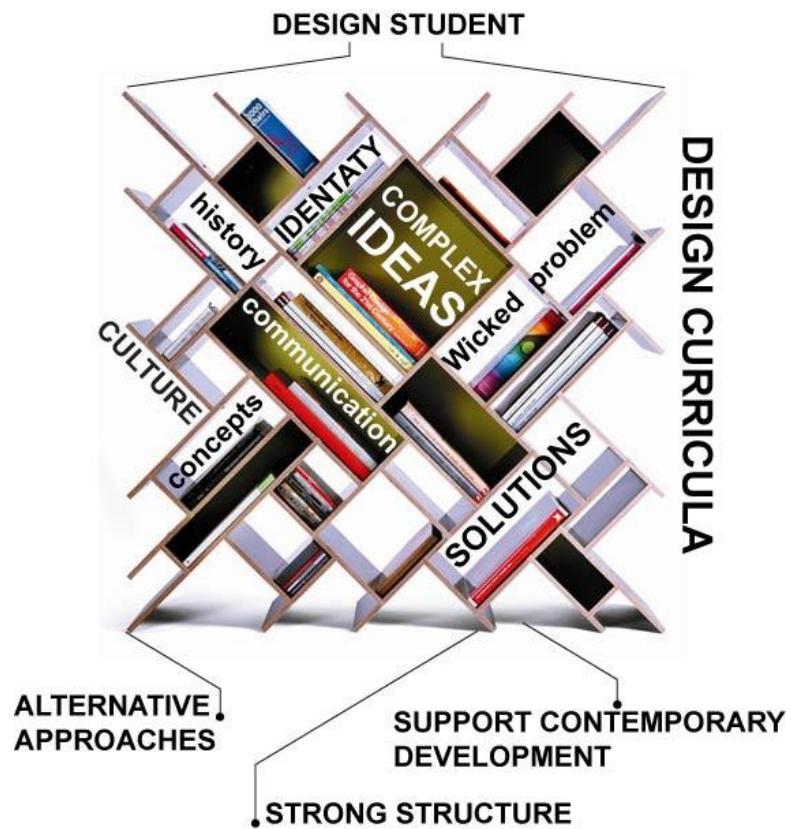


Figure 1.2: Design Curricula.

Source: Natasha, C. Gonçalves.

According to an analysis by Béla, H. Bánáthy (1991) in his book *Systems Design of Education - A journey to create the future*. Educational predicament of the last decade have come up with a number of specific problems that need to be corrected and that there is much more to the genesis of a current crisis in education. The author suggests that there are two main sources: The first is rooted in our prevailing mind-set way we think about education and consequently the way we have approached educational change and reform; This due to the fragmented study of education and the traditional scientific orientation of educational scholarship. The second source is the lack of realisation of the design of educational systems and the gap between the rapidly changing social developments and the persisting (unchanged) nature of education. Changes in our society present a great challenge to all social institutions, including education.

1.1.2 Relevance of the Problem Objective

Design as a practice is very versatile and has little boundaries; this is no different when it comes to design education. There are no specific rules or regulations when it comes to ‘how to pass on design knowledge’ and every faculty may have their own unique method in how to do so. Some may base their design education methodologies on the impact technology has in our lives, others may focus on design collaboration and working with industry, another may base their design education on design theory and philosophy, some other may favour the development of creativity, and it is not uncommon for a faculty to try to combine more than one of these approaches if not all of them. If there is one thing that we have all witnessed throughout the history of design and design education is that there is not ‘one right way’ or one right approach. There are just those which may have had more recognition than others.

Looking in to the design curricula of faculties from different regions and countries, may allow us to understand why it is that each faculty chooses one specific approach and not another. As well, why the approach they have developed or adopted is the most adequate for their specific design course.

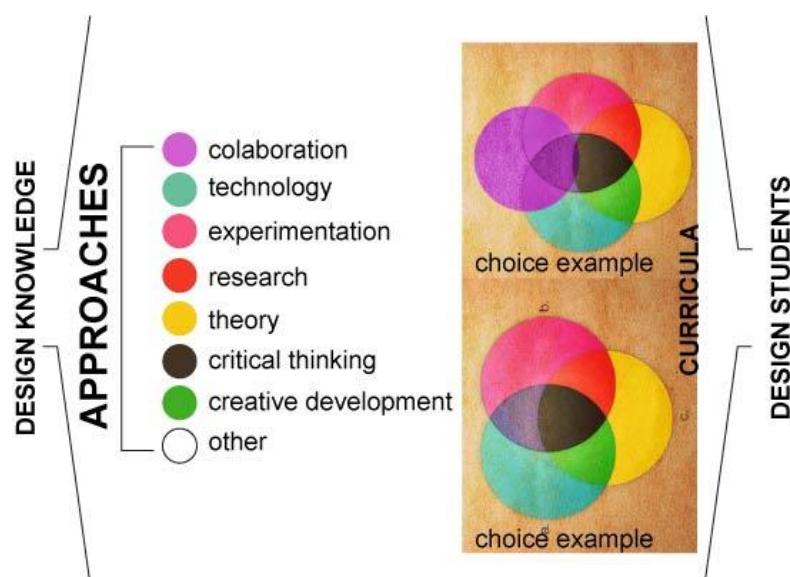


Figure 1.3: Design Knowledge-Design Student.

Source: Natasha, C. Gonçalves.

1.2 Objectives

1.2.1 General objective

The general objective of this study is to explore relevant epistemological and pedagogical theories to construct a useful and compelling basis that will contribute to the understanding of design processes in design education thus creating a heritage of information, and for the development of design curricula. Further on the results of this study will be directed to the curriculum program of the University of Aveiro in order to reflect upon this information.

1.2.2 Specific objectives

This study aims to research the various and divers approaches of several faculties of the occidental world, and analyse the curriculum structure of their design courses. Through this analysis it is estimated to create a panoramic view of the differences and commons of the various approaches, and how each curriculum communicates its point of execution;

It is also important to support this analysis with a strong ‘body’ that will serve as a point of comparison, discussion and observation, as well as providing a case study of the establishment of a design curriculum. In this case, the ‘body’ employed is the Design curriculum of the Communication and Art department of the university of Aveiro, structured by Professor Francisco Providencia, (2003).

1.3 Methods and Tactics

Employing concepts and methods drawn from other disciplines to explore design, or encouraging individuals from other discipline and professional perspectives to address what they regard as important issues or themes in the phenomenon of design should be provoked in order to prove that design practice can be adequately understood apart from the issues and concerns of contemporary cultural discourse.

Many well noted designers, historians and theorists have contributed to establishing the foundations of design studies, a field of inquiry directed toward better understanding of the ideas and methods lying behind design practice.

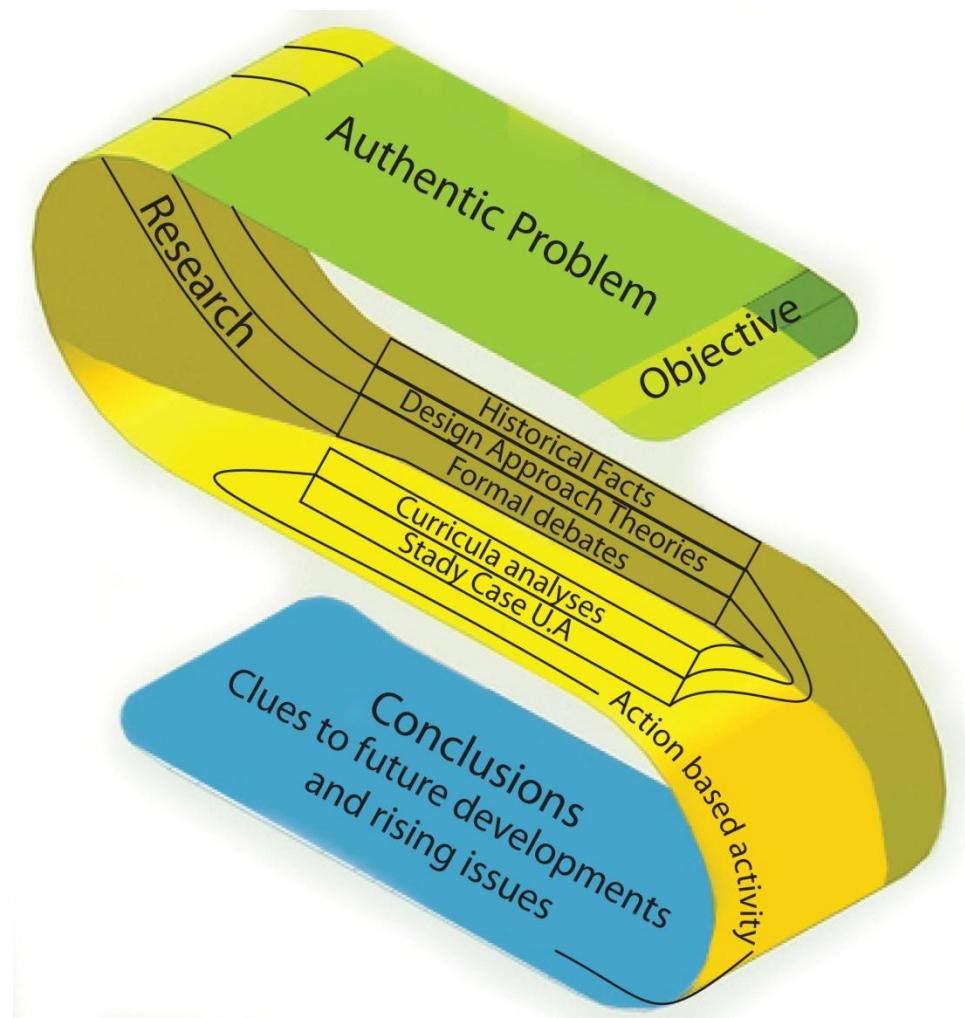


Figure 1.4: Methods and Tactics

Source: Natasha C. Gonçalves.

1.3.1 Work Approach

In an attempt to find the answers to the above questions, related topics will be debated and analyzed throughout this study with the help of professional opinions, papers from several international design education conferences, and publications of design professionals and theorists, as well as including a specifically created survey that focuses on the relation of the provided study case with other current design curricula.

This study is a result of a gathering of new and spread out information, which has been concentrated using the ability of my own intellectual focus. A large amount of information which has been collected from conferences such as the International Conference (2002), and The Design Research Quarterly (2006) has not yet been published; therefore this study provides ‘fresh’ ideas, concepts and information that for the first time come together under the context of Design Education, Curricula Analyses, and Design Research.

1.4 Dissertation structure

The Dissertation structure begins with the identification of the authentic problem that falls under the Area of Design Education and specifically referring to the development of Design curricula. Second the setting of goals and definition of objectives to achieve through this study. As a mean to understand the past & current situation and developments of this study’s topic & problematic, it is important to resort to specific research which is divided in to two parts. First part which includes the study of Historical facts of several disciplines that may be linked to our targeted discipline of Design as well as the history of design it-self, also a valid source of authentic information is found in several publications of well known professionals and theorists in this area. Such as: Victor Margolin, Nigel Cross, Bernhard Burdek, Nigan Bayazit, Alessandro Mendini, Silvia Pizzocaro, Tomas Maldonado and many more, as well as information found through conferences and debates not only on the subject of design education but to relevant subjects as well.

The second part of research is based on the curricula analyses of the curriculum structure of the communication and art department in the University of Aveiro which is the study case provided. As well as the analyses of other curricula of national and international faculty of the occidental world which will be based on the methods and tactics of a survey (questionnaire) developed to determine the representation logic that each faculty in question prefer in order to communicate their curricula and educational choices. This way the second part of the research development can be identified as “*Action Based Activity*” as information is gathered through live interaction and communication with other representatives of current functioning curricula. After the gathering and analysing of all information from all possible sources, the study provides a general overall conclusion and opens doors to future developments and rising issues.

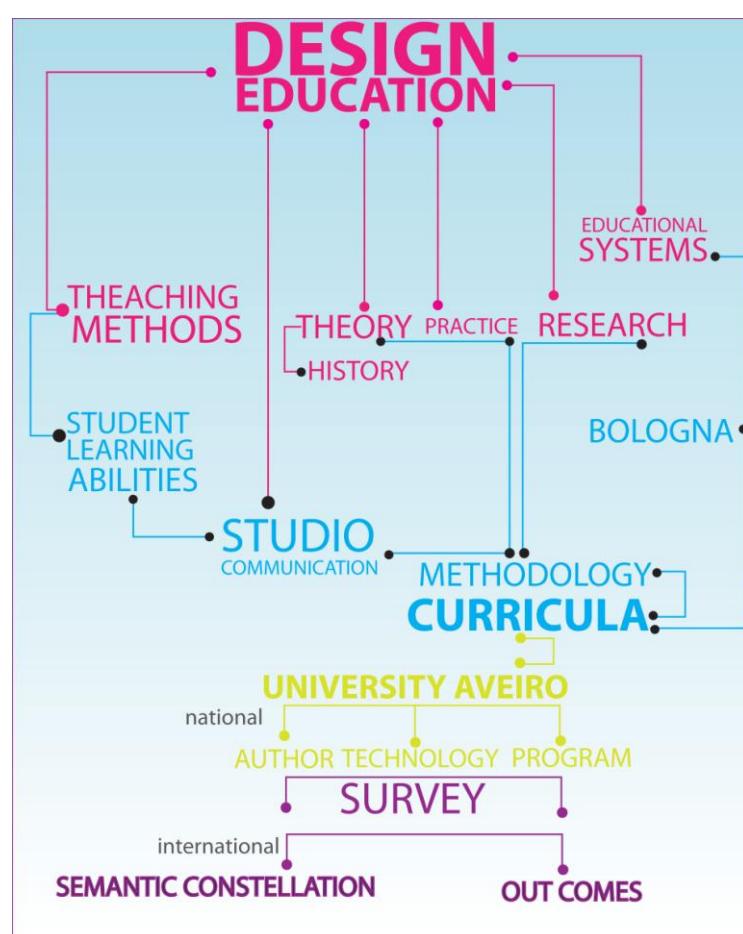


Figure 1.5: Dissertation Structure.

Source: Natasha C. Gonçalves.

1.5 Brief chapter conclusion- Summary

In short this chapter emphasises the importance of a well structured curriculum and the role it plays as a guide when approaching a design discipline for the design student and teacher. How specific academic choices, methods and tactics affect the curriculum and therefore the educational experience of everyone involved. This chapter also raises questions such as, where does Design education position itself within the alternative approaches of education that exist today and how the design curricula supports this position. How Design as a discipline with very limited boundaries step out of the mind-set ways of traditional scientific orientation while keeping up with the rapidly changing social developments and the persisting (unchanged) nature of education?

2 Chapter – Design Education

What is the purpose for the study of design education? The goal is to try to define, the potential contribution that design education and knowledge might make, for design's self-understanding (the self-comprehension of design; the means of how it understands what it achieves, how it negotiates with the world, what it means to design) and to knowledge in general. Design can be identified as a subject in its own right, independent of the various areas in which it is applied to practical effect.

The questions or issues that should be addressed when referring to design as a discipline include: Can design be a discipline in its own right? If so, what are its distinguishing features? To what questions should the discipline address itself — in both research and teaching? What methodology does it use? What results — what applications — should be attempted to achieve?

Design and Design Education, although young in comparison with many disciplines, it has had sufficient time to be considered a responsible discipline. The above issues are now being addressed in many faculties around the world like the Institute of Design, Illinois Institute of Technology, which with this self-examination process has led to a re-conceptualization of the faculties programs. These are also issues addressed in Design Research and that will be further developed in this study under Design as a field of investigation.

2.1 Educational alternatives today

Based on the proceedings of the Ohio Conference on education October 8.1998, Buchanan Richard, Doordan Dennis, Justice Lorraine & Margolin Victor, Doctorial Education in design 1998: the broad alternatives of education could be divided in to two categories:

- “*Paleoteric direction*” which means the “old learning” or “antique learning”. “*Paleoteric thinking*” is based on the identification of discrete subject matters, such as we find throughout the university today. The goal of education is to

expand the knowledge in greater and greater detail. Paleoteric education seeks to expand knowledge in new discoveries.

- “*Neoteric direction*” which means the “new learning”. “*Neoteric thinking*” is based on new problems encountered in practical life and in serious theoretical reflection. The goal is to gather resources from any area of previous learning in order to find new ways of addressing the new problems, thereby creating a new body of learning and knowledge.

In order to create a new pedagogical approach, which of the above enterprises would be more appropriate for design education and why?

There are advantages in moving in either direction. If we consider the state of learning in traditional fields that have achieved remarkable accomplishments in the past and remarkable prospects for new knowledge of nature and human behaviour. We will see that design does not have a subject matter in the traditional sense of other disciplines and fields of learning.

Designers create their subject matter in a way that natural scientists and social scientists do not. If design does have a subject matter, it is the activity of making and the result of making that emerges in human-made products. This is the distinctive domain of experience whether it is actual or only potential. Yet traditional learning has great difficulty in crossing disciplinary boundaries in order to address new problems.

In contrast, design could be identified as a transdiscipline because it makes connections across diverse bodies of knowledge, seeking their concrete integration in the creation of new products. We prise the ability of designers to move across disciplinary boundaries, and seek to better understand how they are able to accomplish this. This is why design education should lean toward “*neoteric*” enterprise and be shaped as a model of what the new learning may be in our universities and in our culture as a whole.

Knowledge and Organisation

The debate on the changes taking place in the economic environment on the passage from the “*Fordist*” model of organization to a new paradigm has focused its attention on the value of knowledge as a determinant of the success of contemporary organizations. The passage from the bureaucratic organization to the learning organization marked a major shift of attention from material resources to human resources. If the goal of a bureaucratic organization is to function as a machine, then the goal of a knowledge based organization is to learn. In fact the knowledge based economy should be addressed as a new interpretation of the economic environment although learning organizations and sedimentation of knowledge, has only recently been considered as a key factor for economic survival and success. Thus knowledge becomes the main strategic asset to enable companies to survive and work. Organizations should be structured so as to facilitate development of both its individuals and the organization as a whole.

Many authors have attempted to analyze the characteristics of knowledge, as it is continuously transforming and sharing its patrimony between individuals within organizations. The combination of work and knowledge seems now to be the focus of debates within the disciplines that deal both with organizational management and social sciences, thus bringing in common parlance the term “*knowledge worker*”, which was introduced for the first time by Peter Ferdinand Druck (1968). The characteristics of the “*knowledge worker*” are the ability to integrate technical competence with management skills. These characteristics have been directly linked to design and the characteristics of the designer. According to Robert Reich (1992) in his book *The work of Nations-Preparing Ourselves for 21st Century Capitalism* where he described the figure of the “*symbolic analyst*” as the new “*knowledge worker*” that had the characteristic of problem solving which had been directly linked to project design and production; as well as of problem identification which is also linked to marketing, advertising, and client consultancy.

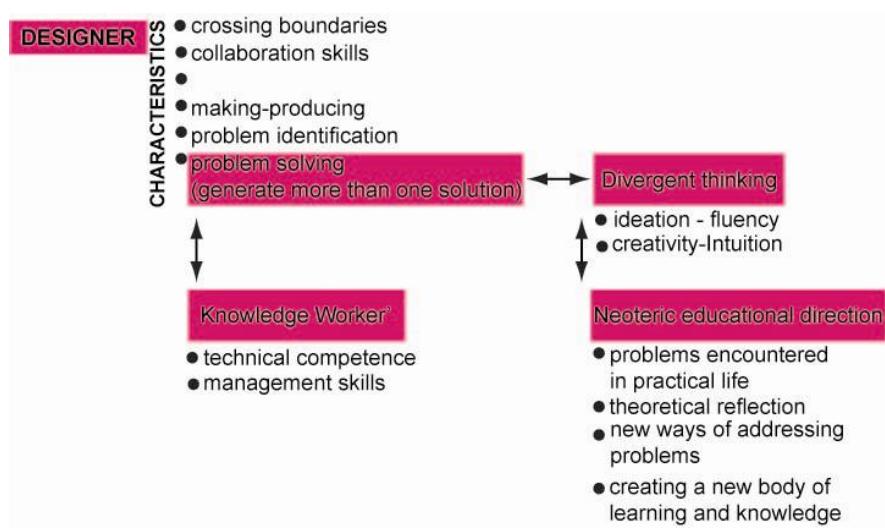


Figure 2.1: Educational Direction.

Source: Natasha C. Gonçalves

2.2 Teaching and Learning

Design students are exposed to a range of different learning experiences in preparation for their professional work. How well students engage with these experiences affect their learning outcomes. Knowing the range of different ways students are affected by the learning experience, allows a better understanding of the kinds of learning environments that should be encouraged and that will eventually result in exiting competent designers.

Matching styles of teaching with styles of learning by design students may lead to an examination of the personality characteristics of designers, cognate professionals and others. Specific learning preferences are called learning styles, and they serve as stable indicators of how learners perceive and interact with learning environments. Teachers also have styles, these are characteristic ways of teaching which emanates from their own personalities and preferences.

In a study report called *Personality and learning preferences of students in design and design-related disciplines* by Durling David, Cross Nigel, & JOHNSON, J., (2002) fundamental differences were revealed in the world views adopted by different occupational groups which affect instructional models, type of content, and control of the learning process.

Hudson L. (1966) proposed two kind of problem-solving behaviour which includes the "*Divergent thinking*", and the "*Convergent thinking*"; Designers seem to identify better with the "*Divergent thinking*" because it moves away from the known and predictable and is characterised by ideation and fluency with unusually associated ideas, probably because Designers creativity also seems to be linked to intuition. Where more natural scientists and technologists prefer the "*Convergent*" way of thinking which progresses toward the production of a single, right answer to a problem, and is characterised by a logical, analytical approach to problem-solving.

So it would be understandable that using the wrong or not so appropriate style of teaching may cause a mismatch with the style of learning. Therefore the student may experience psychological discomfort, and knowledge transfer may be impeded. But not all members or students will share exactly the same style; leading to the conclusion that one kind of treatment is therefore insufficient to cater for the needs of an entire group. No single treatment is suitable for all design students, and so teaching should be adaptive.

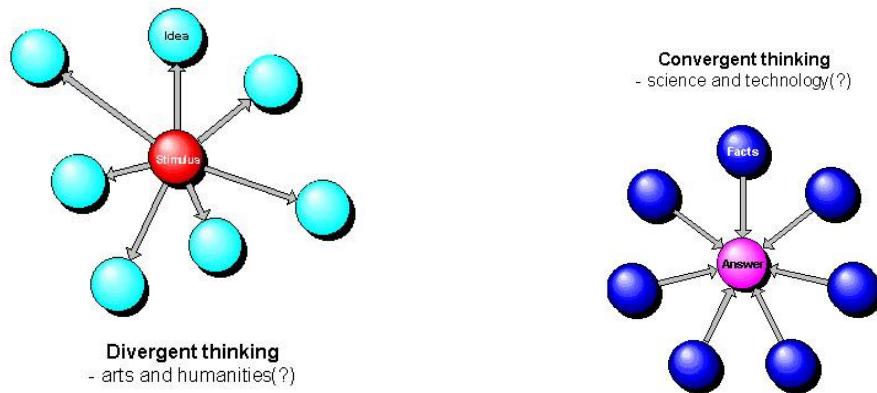


Figure 2.2: Divergent &Convergent thinking.

Source: <http://www.learningandteaching.info/learning/converge.htm>

Accessed: 3.May.2010

This study also provided a Broad Teaching preference for Designers:

- Begins with the big picture, with concepts and then explains details.
- Is focused toward future possibilities and gives alternative viewpoints.
- Has lightweight structure, allowing for guided exploration.
- Mostly shows objective data, is logic and analytical, and is based on exemplars showing things. With exception that about a third of designers will prefer more subjectivity, a person-centred approach, and the utilisation of value judgments.

By comparison to the non-designers that prefers teaching which:

- Begins with details and facts, and then generalises.
- Offers more guided instruction which proceeds step-by-step.

Nigel Cross (2006) along many others he (ibid.) has pointed out that one essential difference between design and science is that design does not concentrate on explaining the existing, but aims at understanding what could be- to develop future visions of the human world.

2.2.1 The role of Inspiration

According to the study *What inspires undergraduate design students?* By Paul Rogers & Alex Milton (2001) which main objective is to explore the relationship of undergraduate students concerning their design inspiration source from fields such as art, cinema, literature, architecture & other. Also the mentioned study is interested to measure the undergraduate student's level of design awareness and if this level provides an indication as to how well a student will perform their undergraduate education. The results of this study indicated a correlation between a student's academic performance and their design awareness score; indicating that students with higher design awareness ratings will perform better than their counterparts with a lower rating.



Figure 2.3: Inspiration.

Source: Natasha C. Gonçalves.

Along the study eight questions were asked to a total of 25 undergraduate students:

- What building (past or present) inspires you the most in your design studies?
- Which three-dimensional product (past or present) do you feel has had the most impact on your design work?
- Which author (living or deceased) inspires your work?
- Which automobile design (past or present) inspires you the most?
- Which film (past or present) has inspired your work recently?
- What music inspires you the most in your design work?
- What magazine do you read regularly that inspires and informs your design work?
- Who is your favourite designer (living or deceased) in terms of the impact they have had on your design studies?

From the data gathered during this study, the results did indicate that there may indeed be a correlation between a design student's level of design awareness and how they perform in their formal design coursework.

2.2.2 The ability to Learn how to practice Design

Design as a discipline seemed about forty years ago to have been founded on a strong desire to recast design in an image of science. The original aims may well have been an understandable reaction to a previous view of design as an ineffable art and therefore as a result of lack of understanding of design ability led to attempts to reformulate design activities in inappropriate ways.

According to the author Nigel Cross (2006) and a series of analysis of design ability strengths and weaknesses, Design Ability has distinctive Features.

- First designers usually have the ability of creativity and intuition, and they are happy making judgements which are intuitive. (Where for example engineering designers although capable to do so, they do not feel comfortable making intuitive based judgments, they prefer to work on the bases of tests and measures.)
- Second common that designers posses is based on the recognition that there is not only one solution to a problem, and that problems and solutions in design are closely interwoven.
- A third common is the need designers have to use sketches, drawings, and models of all kinds as a way of exploring problem and solution together, and of making some progress when faced with the complexity of design.

In other words, the major aspects of what designers do are: Production of novel & unexpected solutions, toleration of uncertainty & working with incomplete information, application of imagination & constructive forethought to practical problems, as well as the use of drawing and other modelling media as means of problem solving. Since every design task is unique, it possesses different conditions, constraints and resources. Designers must develop their own knowledge system and co-ordinate existing and new skills and knowledge together successfully in order to meet the requirements. *"Designers use their innate skills to translate ideas and knowledge about the world around them into new products, messages and environment"* Cooper & Press (1995), (ibid.). Although designers from different disciplines have particular strengths in their specialised field, Bruce and Cooper (1997) (ibid.) classify the skills of a 'designer' into two main categories- '*practical*' and '*cognitive*'. Traditional types of skills involved in undertaking design projects which distinguish the 'designer' from other professionals include visualising, model making, simulating and testing, and technical drawing and diagrams.

But designers were not born as designers, in the beginning we are all the same, we are just human beings with potential to develop different skills some more directed to the features of a designer and others will develop other skills. The skills we develop may be influenced on the different societies we are brought up in to, such as: industrial or nonindustrial societies, craft-based societies. Although some aspects of design ability can be seen to be widespread in the general population, it has also become clear that the cognitive functions upon which design ability depends on, can be damaged or lost. Experiments and observation in the field of neuropsychology, particularly the work which has become known as "split-brain" Reeves and Roberts, (1995); studies have shown that the two hemispheres of the human brain have preferences and specializations for different types of perception and knowledge. Based on this thought design ability can be seen as a form of natural intelligence, a multifaceted cognitive skill possessed in some degree by everyone.

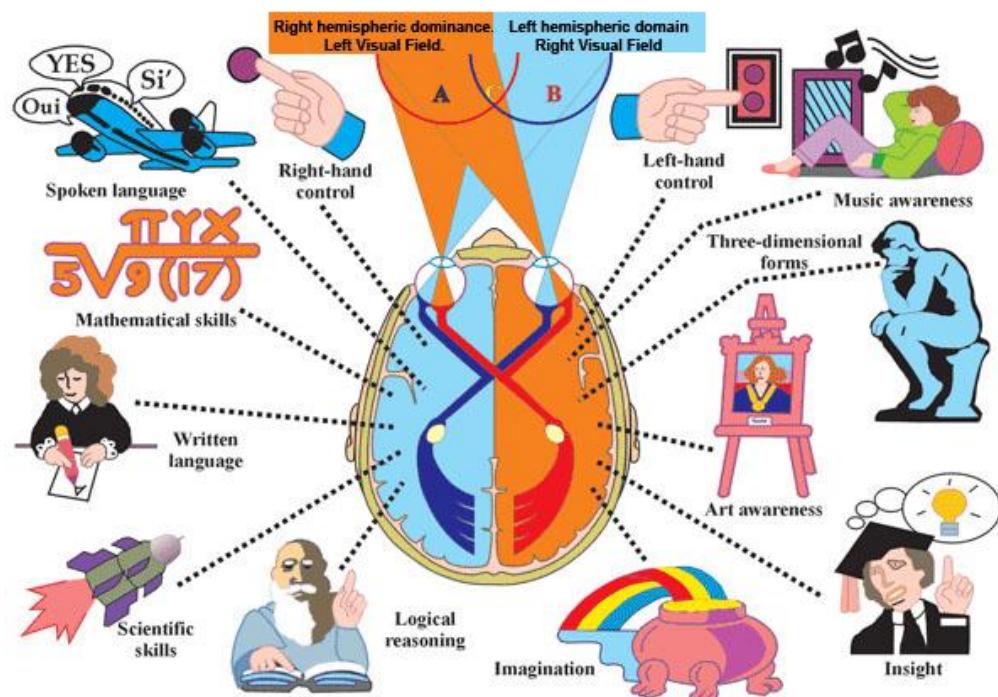


Figure 2.4: Split-Brain.

Source: http://www.peace-files.com/PROPHECIES_FILES/041_Splitbrain.gif

The role of design as a discipline is to through various stimulants, theoretical, practical, from the past or present cultivate these skills found in design students, challenging their sphere of knowledge and abilities, aiming to develop them to the highest degree possible in order to create design professionals. It is also very important to focus on the attraction and importantly- retention of creative individuals providing them with the freedom to take risks without the threat of criticism and failure.

“Professionalism is based on knowledge and skills.” Victor Margolin (1995.pp23).

Intentionality

Every designer and therefore every design student brings to the task of design their backgrounds understandings and a desire to address the contingencies of the design task. Their intentions largely depend on how they understand what the task is about, and what they think or do under the conditions they encounter. What designers learn through education and experience influences what they do and help to build the meanings their thoughts and actions have for them. Although there has been studies on the reflective thinking during design and research on the applications of design strategies by industrial designers such as Cross and Kruger (2006 pp. 527-548,) there appears to be little theory-based research concerning how purposes and goals become established and operate in the minds of designers. The shift in intent and focus which redirects specific thoughts and actions to achieve a persistent but changing objective are not well understood.

C. Burnette (2002) dedicates a paper entitled “*Intentionality and design*” to illustrate the concept of Intentionality and to suggest how the representation of human intentions can be made more explicit and useful during design. The author of this paper presents the definition of Intentionality by Johnson (1987, *ibid.*) as the capacity of mental state or some kind of representation (concept, image, word, sentence) to be about, or directed at, some dimension or aspect of one’s experience; arguing that Intentionality cannot be separated from the conditions that give it context and meaning; that this ‘background’ is always part of meaning and therefore of Intentionality; and that the meaning of experience to an individual must be both intentionally established and mediated by human

understanding because ‘otherwise there would be no relation between symbolic representations and experience. Sometimes becomes meaningful by pointing beyond itself to event structures representing prior experience or toward future structures.

C. Burnette (2002 pp.9) goal was to point out that Intentionality serves as the headwater for the flow of design thinking and that no theory or model of design thinking can afford to ignore it and that the implications for design research and practice is that more attention should be paid to the dynamic matching of prior knowledge to the focus of current concern.

2.2.3 Particularities in Design Education

It is appropriate to advance with creating a general model for design education and not look at the particularities of each design course? Would such a model would encounter problems in relation to the specific differences of each design course. Do these questions affect the importance to specify the particularities of courses such as Industrial design when integrated in an academic ambient?

First it is important to take in consideration that the discipline of Industrial design has had a slower developing in many counties, where in other's it has been recognised as a source and tool to gain new product design capabilities parallel to their industrial development much earlier in history. For instance, industrial design education was started in India in the early 1960s on the basis of American and German educational models which developed years before. Latin American countries were influenced by the Industrial design education programs by the German design school of Ulm.

Thus Industrial design educational models are greatly influenced by the economical, industrial and technological development of its country and therefore should be taken in to consideration when creating such a model which would make it different from other educational models developed for other courses and even from other Industrial courses of other counties.

Today in a global connected world of the 2000s, the dichotomy has been weakened by the significant transformation of Design Education it-self due to its experiences in economical, social and technological never ending development and changes. These changes according to Charles Owen (1981), (advocate of the third era of design education), create the necessity for the education to rise to the challenges of new responsibilities and opportunities, new student, new curricula, and a new type of design educator were needed. Particularly emphasises the need for design scholars 'probably the most difficult task facing design education today is developing the faculty needed for tomorrow.' C. Owen (1988.pp.7).

C. Owen (1988.pp.7) also pointed out the need and difficulty of finding research faculties in design programs by stating that: "*Design Education, except for engineering design and some architectural design, has had the tradition of the fine and applied arts as its model, where personal exploration substitutes for research. Producing the substantial knowledge base and system of communications necessary for vital research will require more than just the efforts of industrial schools and faculties for progress on a broad front, an effort on a larger cooperative scale will be required.*"

Changes in the development of communication technology have raised the issue of reinventing or re-creating the university. This issue rises questions regarding the relationship and balance between material and virtual, between physically localised and technologically mediated interaction which is quite complex in the areas of art and design seeing that these are areas that dedicate fundamental importance to materiality and physicality. When approaching this issue from a design studio point of view. According to by Artemis,Yagou (2004) The studio culture as we know it from the past has been traditionally the learning environment which was established with a central role as the place of experimentation, information exchange and socialization. The fist model of a studio based education begun in the workshop of Bauhaus where learning by doing was related through practical work, emphasizing the exploration and combination of form, colour, material and texture. This traditional studio culture has had some difficulties in holding its ground against the demands of current practice due to remote interaction via technology.

One of the questions that Artemis Yagou (2004 pp.2) asks is, “*What are the future scenarios for designers beyond the traditional parameters of design practice and the form of education that will be needed?*” the answer to this question lays in the ‘Virtual Design Studio?’ which allows designers to communicate across space & time, representing information electronically, and implement design ideas to remote geographical locations seeing that design activities have become dispersed worldwide braking distance boundaries. The technology used to provide this communication includes CAD, image processing, World Wide Web, video conferencing, email, shared file and file transfer, shared whiteboards and specialized software for Computer-Supported Collaborative Work. Also through electronically connected workshops allowing the studio to become an extensible network of contacts, which may be located anywhere in the world braking communication barriers.

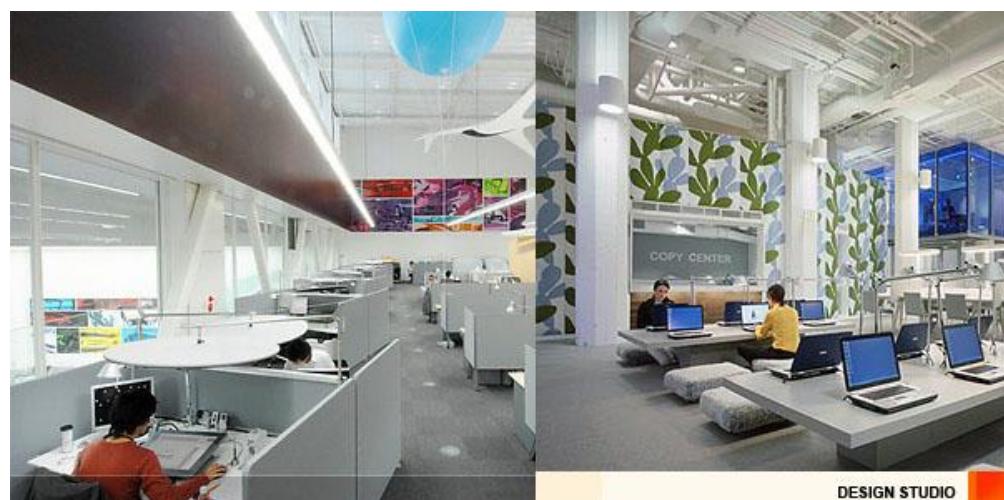


Figure 2.5: The Nissan Inaugurates New Global Design Studio& FIDM Design Studio. Source:www.designer.com & L.A Campus Design studio.

It is although very important to realise that technology does not substitute the role or physical presence of the educators, scholars and teachers. As said by the Greek philosopher Κλεόβουλος “παν μέτρων ἀριστων” which signifies that everything should be used in correct measures. Technology should be used to assist man and not take over the actual role man plays in the educational environment or in any environment for that matter.

A large number of virtual design activities are currently taking place in universities all over the world by employing virtual design studios. Some of the pioneers are Cornell University, Delft University of Technology, ETH Zurich, Massachusetts Institute of Technology, University of British Columbia, Hong Kong University, National University of Singapore, University of Sydney, University of Toronto, Washington University, National Chiao Tung University in Taiwan and Warsaw Polytechnic.

2.3 Activities and issues within the design and design disciplines.

Kees Dorst (2006) in his book *Understanding Design*: attempts to create a series of 175 essays that provides a panoramic view over the subject of design, The essays are written to challenge design students, to reflect upon many aspects of their field, embracing a wide variety of design disciplines, ranging from product design and graphic design to mechanical engineering, software engineering and architecture. These essays deal with many issues and problems within design practice which spring from the fundamentals nature of design and are, therefore, common to all design disciplines. According to the author, it is much more useful to choose a variety of criteria's to discern different models of designing, than to draw lines between the design professions as if there were separate species. The author states, that the lines between the design disciplines have always been vague and they are blurring rapidly, pointing out that there are many other criteria's besides professional categories to use to discern types of design practice. Such as the constrained nature of design problems, the structured or unstructured nature of the design knowledge needed to solve these problems, the costliness of prototyping, and the amount of integration required because of the stresses of mass production. The peculiar traditions and rituals of a design profession, and the role a designer plays during the whole process of bringing a new 'something' in to the world with cultural aspects also being extremely influential to the working reality of a designer.

Constraint: There are two kinds of design problems according to the essays. The first being the ‘Open’ design problems that require the ‘creative’ designer to play with concepts and ideas through a wide range of possibilities before settling in a firm direction. And the second being the ‘Closed’ design problems which are more like puzzles and have their own strategies, the closed problem designer will try out solutions, and the feedback from evaluating the design is immediate and clear. The different skills required in the ‘idea juggling’ of the open design problems and the ‘puzzle solving’ of the closed problems, possibly involving completely different types of designers.

Knowledge structure: The thinking tools available to designers depend upon the knowledge structure of disciplines that play a role in the design project. In some technical domains it is possible to reason from problem to solution in a relatively orderly way, however this does not apply to the fields of aesthetics and form-giving which consists of some psychology, some art theory and some craftsman knowledge for what can be done with forms, colours and texture. All of these sub-domains are completely unconnected and have to be combined by the designer during every new design, on the bases of personal preference, taste and style.

Mass Production: The nature of design problem is greatly influenced by the number of units of the design that has to be manufactured. If a design has to be mass-produced, this puts a large emphasis on the efficiency that must be attained in the design. Using as little material possible to perform a maximum number of functions is in the designer’s greatest interest when it comes to mass-production.

Prototyping: Design problems are very broad, so it is impossible to list and explore all potential solutions. The designer or student would have to choose and rule out options as early as possible, striving to be reasonably sure about his design when it comes to the point where a prototype has to be made due to expenses that creating a prototype would require in a design project once the designer leaves the academic field and is working for the ‘real world’. Design disciplines where prototyping is more expensive tend to build in many intermediate steps, checks and balances into their projects to avoid wasting time and resources.

In other design disciplines such as web design or interactive system for a computer for instance the above statement does not apply. In this case the designer is working on design that are easy to replicate, and that will be used by means of the same medium on which they are made. This can be an advantage due to the user testing that can be made at all time. Design becomes an evolutionary process where the designer is able to test many generations of the design before delivery.

The author points out one way to get a fresh look at the social aspects of design life by studying designers as if they were a new discovered tribe. Exploring human behaviour into a design department would make visible a lot of things that may have been seldom described such as noticing that a major portion of design work consists of negotiation about information, problems, and ideas among colleagues; Negotiations that are often not conducted on the basis of objective information, conclusions that may be reached according to the status of the one of the parties, or simple human rules like 'if you give in now on this point then i will give in next time on another' Kees Dorst (2006,pp.39). People of a design team act as a major influence on what is decided and not always are the final decisions made by the people who are formally in charge. The role of a designer has important distinguishing characteristics. Some architects or designers are cast in the role of the 'creative', and hand over the design concepts to technical people to iron out their constructions. Others have a much more integrated approach, and actually use the technology of construction as a source of creativity. When it comes to define if a design project was been successful, it may be judged on its ability to reach speed, efficiency and return of investment. But a design may also be considered successful because of the learning experience they provide. Many times such projects are messy and full of friction between the parties involved as well as false starts, trials and errors, and overruns in time and cost. Such projects although having many set backs are appreciated for their learning experiences especially in an academic environment and many times may serve as starting points for other projects.

Understanding design as a complex activity due to its ability to touch both creativity and analytical reasoning; the word Design may refer either to the end product or to the process and even though design may be seen to an extent as a generic activity, there are real differences between the end products created by designers in various domains.

Many forms of design deal with both precise and vague ideas, call for systematic and chaotic thinking, need both imaginative thought and mechanical calculation. Kees Dorst (2006) focuses on one of the main goals of design which is *problem solving* of complex problems which nature may not be easily related to by non-designers.

The idea that design is problem solving has lead to the development of phase models of the design process, in which you first define the problem, analyze it to formulate requirements and then generate solutions; The designer chooses between these solutions with the help of the requirements, and then implement the chosen solution. This model of design as *problem solving* has worked well, although it has also been criticized. Like any model it highlights some aspects of design while neglecting others. Yet it seems that as long as the design goals are explicit, clear and stable, and set of comparable solutions can be generated, design can be treated very much like *problem solving*. But the *problem solving* model is not enough when we want to know more about design then just how to control and structure it.

The author also stresses how the designer gains knowledge within the design project as the gradual gathering of knowledge about the nature of the design problem and the several routs to take toward a design solution. Therefore through proposing, experimentation, learning from the results, sketching, improving, changing and going back and forth in this process; a learning cycle is created and the designer or design student learns his/her way toward a design solution.

Designers of today should not be trained to follow a set of procedures due to the rate of changes of the world. As a result of technological development, there have been new design domains emerging.

Design has always been connected with our contemporary intellectual endeavour including art, science and philosophy. Design student of today are expected to both appreciate historical work in its own, but also use it to inform contemporary design. The author points out that one of the weaknesses of the traditional studio is that students, in paying so much attention to the end product of their labours, fail to reflect sufficiently on their process.

"We can no longer afford to immerse the design students in a few traditional crafts. Rather they must learn to appreciate and exploit new technologies as they develop". V.K. Jagannathan (n.d. pp.2)

The author Kees Dorst finds the designers process to be gradual and expresses it as an evolution, explaining that the initial idea in a design process may be seen as the primitive object, evolving and becoming more subtly tuned to the design problem over the generations.

As the designer acquires more knowledge about the design problem and about possibilities to solving it, the design also evolves during the design project; So creative design is not a matter of fixing the problem and then performing a 'creative leap' to a solution.

Creative design is more a matter of developing and evolving both the formulation of a problem and ideas for a solution, while constantly shuttling between them. The aim of the design is to generate a matching problem-solving pair. In other words design involves a period of exploration in which problem and solution are evolving and are very unstable, until are (temporarily) fixed by an emerge idea which identifies a problem-solution pairing. The creative event in design is not so much a 'creative leap' from problem to solution by an idea. A creative event is the moment of insight at which a problem-solution pair comes together.

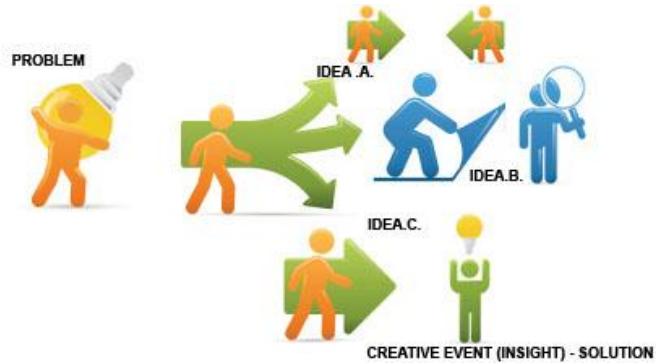


Figure 2.6: Problem-Solution.

Source: Natasha C. Gonçalves.

The same problem-solution process is expressed as a social process when seeing the complexity of the design problem and the necessity for the cooperation of designer with other designers and consult specialists from various fields making the design process a social process as well. These people don't only bring their knowledge to the design project; they also bring their own point of view, expectations and ambitions. They represent widely different aspects of the design, and come from different knowledge fields; these groups often have trouble understanding each other. Yet for a design to succeed, it has to perform well within all these different worlds (financial, technical, ergonomically, aesthetical, and other). There is no single overriding perspective that encompasses all aspects of the design problem solution. Because of this, designing becomes a process of negotiating a consensus among all the participants who have different interests in the design.

The idea of design as communication and its related themes have animated more discussion of design theory and practice than any other. Referring not only to graphic design, where communication is an obvious goal and where the concepts of classical rhetoric are now being applied with promising results, but also to the large field of design, which ranges from industrial to product design, to architecture and urban planning and for which there is no unifying theory of rhetoric Kees Dorst (2006).

Design Problems-Solutions:

Among the 175 essays written by Kees Dorst (2006), a few are dedicated to the understanding of problems and solutions within the design activities and processes that may be experienced in academic projects and further in to the manufacturing and working environment that the designer may encounter in his /her future. Designers design not only for them-selves but most of the time for others who find it difficult to describe and create good solutions for certain problems. In order to do so, a wide range of skills, education and training is required.

Design problems have been called “*Wicked*” C. West Churchman (1967). Horst Rittel and Melvin M. Webber (1984, pp. 135-144) formally described the concept of wicked problems contrasting “*wicked*” problems with relatively “*tame*”, soluble problems in mathematics, chess, or puzzle solving.

“*Wicked Problems*” have been described this way due to their differences to other kind of problems. For instance the chessboard is a nicely enclosed world, in which the value and the possible moves of all the pieces are known and the goal is clear. But the structure of a chess problem is not present in the case of design where there is no fixed playing surface, many outside influences which can disturb plans at any time and considering design problems from different angles will give a different picture of what can be done to solve it. Also the moves possible for the designer are not pre-defined as in the chess game; there are no rules in design except for the limits set by law and the conscience of the actual designer.

The goals of the design project depend on the interpretation of the people involved, and that may shift during the design project, for instance due to competition. This changeable nature and subjectivity of design problems are never ending till the end of the project and finally there is no assurance for success or failure of the project.

In brief "*Wicked problem*" is a phrase used in social planning to describe a problem that is difficult or impossible to solve because of incomplete, contradictory, and changing requirements that are often difficult to recognize. Furthermore because of complex interdependencies, the effort to solve one aspect of a wicked problem may reveal or create other problems.

Undetermined problems are one of the major aspects of problem-solving that designers have to deal with; these problems are not completely fixed, but also not completely free. They usually have a triple nature:

- They are partly determined by needs, requirements and intentions. A designer had to reserve time in the early stages of the design project unearth these needs, requirements and intentions by gathering and analysis, and learn to accept these specifications.
- A major part of the design problem is undetermined. The interpretation of the design problem and the creation and selection of possible solutions can only be decided during the design process on the basis of proposals made by the designer. These proposals entail both the possible interpretation of the design problem and possible solutions to those problems.
- Part of the design problem can be undetermined, in the sense that the designer is, to a large extent, free to design according to taste, style and abilities. It is, of course, not the case that the designer will never have to defend these aspects of the design to others. However the designer is dominant, in the sense that he/she provides the criteria on which these aspects of the design are to be judged.

In design projects it is not always easy to see the type of design challenges that have to be dealt with. The amount of difficulty or the amount of freedom is never clear. It is extremely important that the interpretation of the designer toward the design problem is relevant to the stakeholders, and they also agree on the kinds of solutions this particular view of design problem will lead to.

In order to insure a good fit with the stakeholders, it is first required to find out what their fixed demands are. Around the core problem there is a lot of freedom, where an interpretation may be chosen as long as it can convince the stakeholders that the specific interpretation will be fruitful and lead to a good solution.

When it comes to creating a solution for a design project problem there are several aspects that must be taken in to consideration, because designers not only produce ‘things’ but also develop the way of using those things. The author Kees Dorst (2006, p.28) states that it would be more logic to develop the ‘way of using’ or the ‘user plan’ primarily and then continue to design the design itself. The aspects that must be taken in to consideration are:

- Interaction – Technological advancement has meant that many of the things designed are now so complex that the ability of the user to interact with them can-not be taken for granted. The interaction itself has to be designed, keeping in mind two main questions. The first being, how can quality in the interaction itself be achieved? The second, how to achieve efficient and effective use of design?
- The story behind the design – consists of all the choices the designer makes during the design project and the argument used to all the choices the designer makes during the design project and the argument used in making them. It is the justification of the design, which explains why the design is exactly the way it is. It helps defend the design to others, and it allows the designer to keep track of the designs progression. A design can be seen as a tightly knitted web of decisions which are not independent from one another; chances are that by changing one aspect of the design solution, readjustments will be needed in a lot of the other aspects as well. The tricky thing is to be able to return to those early choices and revise them without disturbing the whole design.
- Justification of the design – Explaining the logic behind the design will work as a good fall back that can be the projects history to explain the choice that have been made.

- Showing the design alternatives that have been considered and explaining the reason for their demise will strengthen the argument in favour of the chosen design considerably. The design will many times be compared to competitive designs on the market in order to establish a design's relative quality. It is therefore important to be aware of the competition.
- Planning and communication – Designers make plans, they plan the behaviour of the design and the behaviour of the users of the design as well as the production of the design. Designer plans are expressed in all kinds of different media, depending on the design discipline. All designers make presentation drawings and scale drawings, but architects make scale models, while product designers and mechanical engineers often make prototypes or computer animations. The use of the various media is a clear indication of how difficult it is to convey a design, but it is crucial that this is done well. These plans, drawings and models are ultimately used as tools to interact with the people who are actually going to make the design. They have to take these plans and develop a way to produce the design. This difficult step often leads to many changes in the final design but the quality of the produced design depends on this step as well. Many delicate details may get lost when the production people decide there is an 'easier' way to make it. It is the designers and the designs best interest to keep lines of communication open to stay involved with the design until the end or even after it is produced.

2.4 Design Practice and Theory

Richard Buchanan & Victor Margolin (1995) in their book: *Discovering Design*; state that one of the anomalies in academic culture of the past century, was and continues to be an excessive separation between culture and practice, between the words and symbols used to understand important subjects and the concrete actions of individuals and groups who employ personal or formal knowledge to accomplish practical proposes. The development of disciplines such as the history and philosophy of technology, material culture, and cultural studies signifies an effort to reassess the importance of things in cultural life. Both authors believe that by broadening the range of discussion in design studies would create a change that would reflect on design as a contemporary practice; Thus creating an expectation for designers to participate as members of interdisciplinary or cross-functional teams such as engineers, computer scientists, psychologists, sociologists, anthropologist's experts of marketing and manufacturing and a variety of other individuals whose perspective on design owes little to an understanding of historical development of professional practice in areas such as graphic and industrial design.

Richard Buchanan (1985) in his publication *Design Issues; dedicates a dignified amount of discussion to the subject Declaration by Design: Rhetoric, Argument, and Demonstration in Design Practice* where he presents the central idea in design to be communication, whether direct or indirect and along with all its related themes. He points out that the idea of communication has animated more discussions of design theory and practice than any other. The author continues by justifying that although this at first glance may not be obvious, the themes of communication and rhetoric in the wide field of design exerts strong influence on our understanding of all objects made for human use. He then presents the example of the numerous historical, sociological, esthetical, and cultural studies of design are not exactly rhetorical, but when dealing with the influence of designers and the effects of design on an audience of consumers or society at large, move deeply in to the domain of rhetoric. Buchanan points out that these studies also involve a significant rhetorical component when they are concerned with the process of conceiving designs; the influence of a designer's personal attitudes, values, or design philosophy;

or the way the social world of design organisation, management and corporate policy shapes a design. Adding that when studies of the ethics of design treat form not only as a quality valuable in itself, but also as means of pleasing, instructing, and passing information, or indeed, as a means of shaping the appearance of objects for whatever intended effect, these studies are rhetorical also because they treat design as a mediating agency of influence between designers and their intended audience.

According to Bernhard Burdek (2006) in his book '*DESIGN-GESCHICHTE, THEORIE UND DER PRODUCT-GESTALTUNG*'; Methodology and Theory of design are reflective objectives which efforts try to optimise methods, rules & criteria that will help design be investigated evaluated and improved. The author states that Theory and Methodology in design is developed and approached in the same manner as it would be in any other discipline: of the bases of determined hypothesis and suppositions that, most of the time are self explanatory.

Practice

Design is an activity that is aggregated to concepts, to creativity, imagination, investigation and technical innovation which therefore generates expectations of the *design process* as a kind of cerebral act. Each object, artefact, symbol or product of design is a result of a process of development which course is determined by conditions and decisions. Socioeconomic, technical and especially cultural developments as well as historical fundamentals play an important role in design and design

activity. Ergonomic factors, ecologic factors, political interests and artistic & experimental demands also affect design activity in great scale. Lawson Bryan (2006, pp.17-38).

To understand the concept of design methodology better it helps to take a look at the evolution of its existence. The paper by Nigan Bayazit (2004) *Investigating Design: A review of Forty Years of design research*; allows us to define the role of design methodology starting after World War II, where the necessity for design methods were developed mainly in the U.S in response to launching the first satellite for NASA, and to help with military-type technological problems. It was Horst Rittel (1973 cited in Nigan Bayazit, 2004, p.2) that expressed the need for a transfer of design methodology in to civilian and other design areas. Therefore we have the development of the First Generation of Design Methods which characteristics were defined at the Design Methods conference organised by J. C. Jones (1962 cited in Nigan Bayazit, 2004, p.2) in the U.K. These characteristics included a more scientific approach to design based on critical analysis. This was an important step for the advance of design methodology, but latter was proven to be extremely simplistic, not mature enough and not capable of meeting the requirements of the real-world problems. For these reasons professionals of the area such as Christopher Alexander and Christopher Jones started to feel that the methodology of that time was not sufficient for the complexity of design activity and believed that this methodology was creating a gap between designer and design methodology. Horst Riteel (1973 cited in Nigan Bayazit, 2004, p.2) admitted to the necessity of a Second-Generation of Design Methods which characteristics were an Issue Based Information System (IBIS) which were problem identification methods, user involvement in design decisions and identification of their objectives influenced by the British philosopher Karl Popper.

Along the development of design methodologies and theories, we come to see that the human sciences also play an important role. The constant crisis of the disciplines senses creates a necessity for reflection and theory of philosophy. Thus it is necessary to make sure what aspects of design theory or design methodology have fundamentals in European philosophy. A few of these aspects are found in Greek philosophy: Socrates ($\Sigma\omega\kappa\rho\tau\eta\varsigma$ 470-399 b.C) can be considered the first Theorist on knowledge that developed and practiced the instruction of method. He did not believe in transmitting ready-made systems and he's main interest was the essence and how to get to the real knowledge.

Plato (Πλάτωνας 427-347 b.C) formulated a dialect, with which its links between many concepts should be investigated through reflection. A general concept would be divided until coming to individual concepts. This method is designated under Dieresis "Διερεσης" (division of ideas). He is the first philosopher known for the definition of rules. Bernhard Burdek (2006, pp. 227-228)

Aristotle (Αριστοτέλης 384-322 b.C) was the first philosopher to investigate the essence and methods of science and was able to divide them into categories of Logic, Ethics and Physics. In his formal logic, this philosopher was able to demonstrate that thought is used in three basic elements; today these elements are still an important chapter of logic: idea, judgement and conclusion. His greatest contribution to Logic was the development of Deduction (from the general conclusion to the particular) and Induction (from the particular conclusion to the general) (2006, pp. 227-228).

Theory

K. Friedman (2002) in his paper 'Theory construction in design research. Criteria, approaches and methods' he defines Theory as a model. He describes theory as an illustration describing how something works by showing its elements in their dynamic relationship to one another. Friedman also finds the distinction between theory & practice and science and craft. The distinction between a science and craft is systematic through organization in theory. Craft involves doing, sometimes craft involves experimentation. Theory allows us to frame and organize our observations. Theory permits the questioning of what it is we see and do. He also presents two forms of design practice. One form of design practice is allied to art and craft, is intuitive, sometimes producing desired results that may or may not have been unpredictable. Nevertheless these results can be seized retrospectively as the useable result of thought. The second form of design practice involves predictability created by effective response to problems, with similarities to science, engineering, and technology.

The bases of design as a science is the idea of applicable theories of how to devise courses of action aimed at changing existing situations into preferred ones. When referring to the development of Design Theory, we confront diverse possibilities of how this theory can be constructed: interdisciplinary, multidisciplinary or transdisciplinary. Rarely is design theory referred to as 'disciplinarily', due to its necessity of support and contribution of other disciplines.

Burdek, Bernard E. (2006. pp.73-202) In his book *History, Theory and Practice of Product Design* divides his discussion of Design Globalization according to the design development of each of 22 countries historically; thus giving us a clear view of each country's "design expression" in a certain period of time. For this study I have chosen to present four apposing "design expressions" that although may have been more strongly expressed in the past, we are still able to trace them to a specific country through historical events.

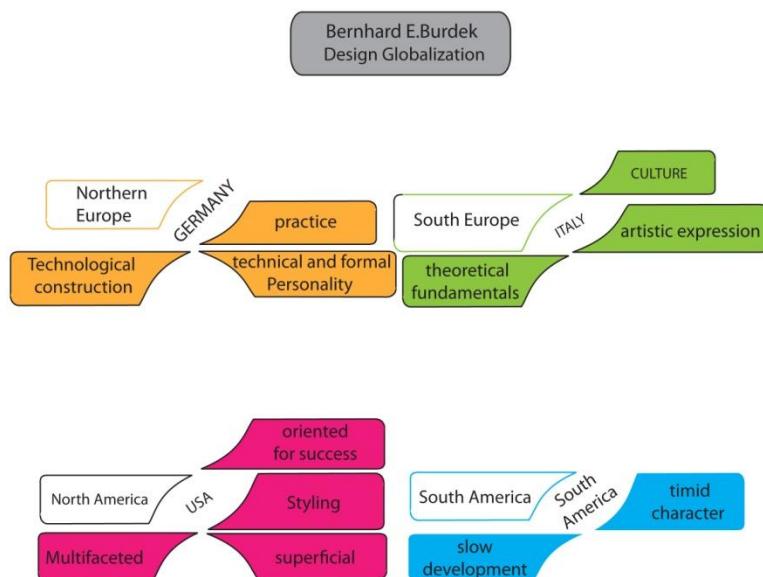


Figure 2.7: Design Globalization.
Source: Natasha C. Gonçalves.

Italy has been considered the country of Design, and also characterized for its contrast between the North Europe which is considered highly industrialised, and the South Europe known for being more agrarian. Many Theoretical fundaments have given Italy the character of its Design being an integrated part in a work of art and directly linking this country to an artistic, theoretical and highly cultural character of design and how it is expressed. The theoretical influence of Italian designer and Professor Alessandro Mendini in addition to others is an important promoter of Italian design and artistic & cultural expression. Burdek, Bernard E. (2006. p.122) At the seminar on design teaching , conducted at the end of the 80's, at the Institute of Architecture of Venice, Prof. Alessandro Mendini expresses his opinion "*a school of design should be more theoretical and less practical, since the professional might be assumed successively*" adding that "*I am also quite negative about the union of the school with the industry, because In short, despite having the modifications of time, a Marxist terminology is still valid when it is said that the intellectual is in contrast to the capital and in a sense, the same also goes for the industry.*" Mendini is the defender and protector of the designer-artist, the professional who deals with large humanistic and linguistic problems, so he proposes that design will be a gesture of art and craft, which he called *hot-design* and also known by scholars as art design, for his great closeness and affinity with the art and craft.

Mendini explains his design project methodology of creating a product "*I think of the object as a painter does the painting: free myself of all the functional constraints and stresses in exasperation, I prefer the aesthetic function ... design objects more or less functional, usually small and occasional. I'm very interested by the form, the material and the colours ... My approach to designing is prevalent artistic and answers to technical aspects, as kind of informative craft. I still hope that the word Design will release itself from the anguish of time in identifying it with the industrial design and, instead, recopy the historic grandeur of the applied arts, absorbing the new ingredient in the field of computer design, can be a remarkable transformation in the future also differentiated from professionalism*".

According to Dr. Silvia Pizzocaro (2005), from the Politecnico di Milano in Italy; Italy has a long tradition in the practice of design as well as design education, a profession dating back of the early years of the century, well based on local crafts and industries. Milano, with its Politecnico, fostered the creation of Italy's first Degree course in Industrial design in 1993, exploiting the fruitful dialogue with the long lasting entrepreneurial and management tradition of the small and medium size companies and manufacturers of the local and national industrial system. Since the beginnings the faculty engaged by this degree course has represented a variety of cultures, merging the scientific and academic subjects stemming from design either in architecture and engineering. A relevant number of entrepreneurs, experts, designers, practitioners in the areas of management, services and culture, as well as professional associations, often joined the local academics. Academic curricula in industrial design (first and higher level) are expected to provide the theoretical, scientific and professional knowledge required by a designer. An enlarged area of learning is articulated by the curricula so to meet as extensively as possible the educational requirements expressed by goods industry, public administrations, companies specialised in the design of communication, interiors, exhibitions and fashion, as well as sectors covering marketing and distribution.

The approach of Alessandro Mendini as well as the Italian "*design expression*" contradicts with the Northern European approach which immediately is associated by the rest of the world according to Burdek Bernard E. (2006) with concepts of functionality, objectives, simplicity, neutralism, sensibility, and economics.

This style of functionality has become a pattern of construction in German Design which is quite linked to the industry. Institutions such as "*Die Neue Samlung*" in Munich, the Design Centre of Stuttgart, and the Design Centre of North Westphalia in Essen have worked decisively along time, contributing to the idea of "*Gute Form*" (Good Form) that was widespread and instituted as a cultural pattern of the mass in the 60s and 70s. This concept came with 10 specifications and characteristics that determine (good form design in industry). Burdek Bernard E (2006, pp.84-85).

1. High practical use
2. Sufficient security
3. Long life span and durability
4. Ergonomic adaption
5. Formal and technical personality
6. Connections with the context
7. Environmentally friendly
8. Visualisation of use
9. High quality configuration
10. Intellectual and sensorial stimulation

A strong representative of the German rationalism is theorist Tomas Maldonado whom at the same seminar on design teaching, conducted at the end of the 80's, at the Institute of Architecture of Venice; represents an opposing opinion to that of Mendinis. Maldonado has been in persistent search and investigation on the orientation of design education in Italy and is one of the defenders of the existence of a project based methodology for design, where more technical and scientific disciplines are included in the curriculum. A good example of this methodology was the Superior Collage of Hochschule fur Gestaltung Ulm in 1953-1956 where Tomas Maldonado along with others directed the school in order for it to contribute to a new culture of construction with the objective to achieve forms of life appropriate to the technical development of that time. Maldonado along with Olt Aicher, and Hans Gugelot were able to introduce new scientific disciplines in the curriculum and create a close relation between science and technology; such disciplines were ergonomics, mathematical techniques, economics, physics, political science, psychology, semiotics, sociology, theory of science and others. Burdek Bernard E. (2006, pp.41-55).

This choice of two professionals of the design field like Mendini and Maldonado which have opposing thoughts symbolizes the wide extent of activity and at the same time, allows us to reflect on the existence of other diverse strands that should be received as a factor of support and maintenance of an activity in constant change as design.

Another two opposing territories according to Bernhard Burdek (2006, pp.177-196) is that of North America and South America. North America has extremely diverse influences of culture, technique and economics due to the entry of immigrants from various countries which had as consequent the development of a multifaceted configuration discipline. Architecture, graphic design, Industrial design, art, music and literature were all directed for a more tolerant audience that encouraged and favoured the medias and styles; this leading to a transformation of the USA in to an enthusiastic diffuser of a success oriented design which led to an aggressive exacerbation of shallowness, also known as "styling". The dominant of product-culture in American design, which became visible in the Asian or European countries, has caused great resistance and great economic dependence, as is the case with several Latin American countries; those affected turn to other examples like those who followed the principles of European design.

The differences between the development of South America and North could not be greater. There is a big difference in the speed of industrialization, as well as in their causes especially the philosophical, historical and cultural. The development of a belief of the north (autonomous progress), which dominated the concept of modernism, especially in the third century 20; The construction of pragmatic thinking William James (1842-1910) or John Dewey (1859-1952) is based on that man is responsible for their own destiny and may at any time improve his situation. In contrast with the culture of the South that is based on Theocentrism. Production oriented exclusively by American standards did not allow room for the development of national or autonomous design. Only after the World War, was the industrial design in Latin America able to start developing. In the 50's Tomas Maldonado who belonged to the artistic vanguard of Buenos Aires. After moving to Europe, he exercised great influence in the Latin American nations with his theoretical contributions on design. A design that should be developed according to the concept of the modern and not depend on the artisan tradition of the continent. Bernhard Burdek (2006, pp.177-196).

A historical example of design development through education systems. Which are the common links between the unfolding of the design curriculum of Bauhaus and the conceptual model of the University of Aveiro? Probably the most influential school of design of the 20th century was the school of Bauhaus (1919-1933). In 1902, Henry van de Velde funded in Weimar a seminar of applied arts that, under his orientation in 1906 was able to transform in to a school of applied arts. With Henry van de Velde interaction with the school of arts and under the direction of Walter Gropius the Staatliche Bauhaus Weimer was formed and came to be the starting point of a great design development. Gropius chose abstract artists and cubism painters such as Wassily Kandinsky, Paul Klee, Lyonel Feininger, Oskar Schlemmer, Johannes Itten, Georg Muche and Laszlo Moholy-Nagy as teachers for the school of Bauhaus. Due to the advancement of industrial production in the 19th century, and the diluted unity between design and production Gropius fundamental idea for Bauhaus was that arte and technique would become a new modern unity. The emblem phrase was: Technique does not require Art, but Art requires a lot of Technique.

He believed that by uniting both Technique and Art there would be a social principal to reinforce art to the public; Based on this idea Gorpius created the Preliminary course which was the heart of basic artistic and polytechnic education of Bauhaus. The Preliminary course allowed self- experimentation and self-investigation. According to Rainer Wick (1982) this was the first phase of Bauhaus.

The preliminary course in the first phase of Bauhaus could be compared with the first intervention of the design curriculum of the University of Aveiro in the sense that both the preliminary course and the intervention of “Author” focus on the cultural aspect of creating and making things allowing individual inspiration through drawing, craft making and the process of investigating, proving and experimenting.

The second phase of Bauhaus is known as the phase of consolidation (1923-1928). During this period Bauhaus was becoming more and more an institution where industrial production and prototyping was being taught. This was a result of the reality of industrial production of that time and the social necessities of a wider public.

Main goal of this phase was the development of products that met the necessities of its public and gave great emphases on functionality and accessibility. Again we find that this phase in the education system of Bauhaus could be linked to the intervention known as "*Program*" of the design curriculum model of the University of Aveiro where the Program intervention focuses on the needs, the functionality and the performances of the client or a certain market and how these factors should be taken in to consideration when practising design.

During the 1928-1933 we recognise the third and last phase of Bauhaus as the phase of disintegration. With the nomination of Hannes Mayer as director new disciplines and workshops were introduced in the school and art was permanently taken out of the curriculum. In 1930 Mien van der Rohe became director of Bauhaus school and in 1933 the school came to its end. The workshop based curriculum at this phase of the Bauhaus school and the introduction of technically based disciplines has common points with the intervention of "*Technology*" used in the conceptual structure that communicates design practice in the University of Aveiro due to the significance of technical development and material in both curriculums.

According to Professor and dean of Swinburne University of Technology in Melbourne Australia Ken Friedman (2002) finds two interesting notes on the role theory plays in design discipline and that are worth considering : the first being that there may well be important new aspects of theory construction to consider in an era of interdisciplinary and multimodal research. The professor states that these issues sometimes imply theory construction across disciplines or between levels, a challenge that can raise significant problems. The second note is the importance of understanding how and why we construct theory -Albert Einstein attributed to David Hume the deep philosophical understanding that enabled him to move beyond Newton's physics to the theory of relativity.

"If Hume's (1711-1776) work could remain valuable to Einstein (1879-1955) over the distance of a century and a half, the "classics" of theory construction may remain useful over a recent run of several decades" Ken Friedman (2002).

2.5 Brief chapter conclusion - Summary

This chapter helps us to understand how Design as a discipline handles itself within the academic environment and how its distinguishing features support the idea that design can be a discipline in its own right. These features such as, crossing disciplinary boundaries and making connections across diverse bodies of knowledge in order to address new problems are the reason why design education should lean toward a “neoteric” enterprise and be shaped as a educational model of what new learning may be in universities and culture as o whole. Such a model will fit and be enhanced by the “knowledge worker” profile and the ability of problem solving that have been linked to the Designers profile of integrating technical competence with management skills.

When creating an educational model it is extremely important that the “teaching style” develops the ability to match learning preferences and take in consideration what affects, the contemporary student and therefore integrate various of those aspects in to the educational experience; The designers personality and creativity have been linked to some extent to inspiration, this is also the reason why focusing on what inspires the student will allow the creation of educational systems and educational curricula that will rise student levels of performance.

It is clear that experimentation and practice is very important when it comes to design and the development of design educational models and curricula. Practise and experimentation is what leads to final results, products, creations and designs; there is no doubt that design knowledge cannot be developed without this important factor. Although practising design and creating or developing new things is not enough. It is as important or even crucial that all design outcomes be sustained and supported by strong roots in order to give meaning and depth to the design outcome. Theory allows us to frame and organize our observations, it questions what we see and do.

3 Chapter- History in design Education

3.1 Design studies and History

The first major impetus of Design history as an academic subject was received in the early 1970s in Great Britain. The First Report of Britain's National Advisory Council on Art Education (NACAE) in 1960, known as the Cold-stream Report, stipulated that all students in art and design should learn the history of their own subjects. About ten years after, a joint committee of the NACAE and the National Council for Diplomas in Art and Design urged that art and design history courses embody sophisticated historical methods and relate their respective practices to social issues and concerns. The mandates in these reports, however, applied primarily to the polytechnics rather than to the university sector. Teachers of design history were drafted from other fields such as the history of art and then set to work developing curricula. The new courses established an initial narrative for the field, particularly as course topics were translated into textbooks and publications for a popular audience. Design history courses were also established in the US, Scandinavia, and other that led to the development of an international community of design historians (Design History Society), founded in 1977, in Great Britain and the Scandinavian Forum of Design history in 1983.

Professionals of the Design area also recognised the importance of design history, this leading to formation of a Design History Working Group in the mid-1980 that produced a *design history bibliography*. Through design history courses taught by design historians or studio design teachers, design students in many countries have come to understand the wide cultural context in which designers have worked in the past and in which they continue to work today.

Researches outside design history have discovered design to be a rich topic of historical investigation, and some of the best design histories incipient scholarly accomplishments have come from scholars in other fields such as art history, American studies, and history itself. Therefore it was a delicate subject to think of design history as a discipline based on what design is and how we might study its past. To do so would be considered ignoring the crossings of intellectual boundaries that have occurred elsewhere.

When design history first began to emerge in Great Britain, it was tied with many boundaries and what was the framework of investigation for a design historian was not clear. Nonetheless Design history has advanced far beyond the boundaries established by scholars who first began to write historical accounts of design activity.

Design history has its own unique way of developing which is not based on a well-understood subject matter, or on a set method, or on principles to guide research. Instead, it has grown as a response to the initial literature in the field, first celebrating and second criticizing it.

Among early publications that debate this subject are: 'Pioneers of the Modern Movement' by Nikolaus Pevsner's, and 'Pioneers of Modern Design' by William Morris to Walter Gropius that was first published n 1936; A publication that proposed a narrative for design history from which most design historians working today have departed, and second it raised the question of what contribution any historical narrative can make to understanding design. Many efforts have been made since the publishing o Pevsner's book, all of them trying to broaden the subject matter of design history. In England, Reyner Banham was one of the first to promote an infatuation with popular culture, particularly that which originated in America. Banham was able to create an important connection between Pevsner's discerning approbation of modern architecture and design and the enthusiasts of popular culture. Before and even after Reyner Banham death he was able to give younger historians the confidence to explore the history of mass-produced goods.

John Heskett, with a particular interest in understanding the conditions of design innovation, brought a set of new concerns to design history in the 1980's with his publications about military airplanes, tanks and air-moved vehicles. Latter Feminism provided a powerful critique of design history; feminists have had to break down the distinctions between history, theory and criticism in order to establish a different vantage point of which to view design and design history. Followed by a long term of continual invention from designers such as Norman Bell Geddes, Raymond Loewy, Charles and Ray Eames helped expand the understanding of what designers do, and that it made more sense to conceive design as broadly as possible in order to lay the foundations for its study.

Victor Margolin (2002, p.226) argues that “*it is the broad activity of designing, with its multifarious results that can open up design historians a range of important new questions that have not been coherently posed and simultaneously can enable designers to consider new possibilities for practice.*” He believes that using an enlarged conception of the artificial as the basis for design inquiries will help undertake new investigation of what designing is and how design affects the new ways of human action possibilities. Asking these questions will lead to reconsideration of how designs history has been previously constituted. Margolin foresees that design can serve as a powerful theme around which the most diverse kinds of inquiries, related to history as well as to the contemporary situation, can be organized. Therefore he proposes two locations for design history; The first being in relation to the discourse and particular concerns of its own practitioners and the second in relation to the wider field of design discourse, where it can contribute to the ongoing research about design and its future. He continues by expressing that design historians should adopt the role of bearing knowledge of design’s best practice from past as well as the recognition of design policies and activities.

They are also able to hold up standards based on experience and extrapolate from prior activities possibilities for the future. Victor Margolin (2002, p.227) strongly believes that design historians are needed to prevent design discourse from taking too strong a turn toward technique as the domain topic of research.

“Historians have the capacity to help shape the consciousness of the design community and to contribute to the articulation of its ideals, principles, and agendas.”

Victor Margolin (2002, p.227)

Students of all areas of design in order to be treated seriously as future professionals should have some exposure to the history of their chosen field as well as to the theories and critical issues within it. In order to find out how this knowledge affects an undergraduate curriculum, we turn to the “*Year long course of Design History by the patch work approach*” of Victor Margolin (1996).

Patchwork Approach: Mixing together topics from History- particularly the early 20th century avant-gardes as well as decorative arts and the scant materials available on the history of graphic design and product design.

Victor Margolin chooses to teach a course beginning with the Industrial Revolution and uses the move toward mass production and communication as the base of his narrative. Also including materials from the crafts, the vernacular, architecture, engineering, and other related fields; Rather than teaching a course that subsumes the entire history of making things under the rubric of “design”. Margolin includes both graphic and product design in his course. Victor Margolin (1996).

Teaching Methodology, and narrative structure-directed to design students.

Functions of a design History course:

- Explain to students what they have chosen to study and to assert that design is not a fall-back profession for aspiring artists, but an independent practice with its own culture. This is achieved by examples: exposing students to images that vary in order for them to begin to see that design is not about narrowly conceived opinions of “good taste”. Rather, it embraces the totality of the human-made environment. This way Design History helps show students how many possibilities there are for making things, and in this way, serve as a way of socializing them into their profession.
- Design history can play a subversive role as well. It is no secret that many design programs seek to instil in students a particular formal orientation and distinct convictions about the kinds of design solutions that are acceptable. Mostly, these derive from the conventions of European modernism, at least among older faculty who themselves studied in programs that emphasized such an approach (Paleoetic direction). However in recent years, post modern strategies have emanated from selected pedagogical strongholds and have managed to sway many students. Design history can undermine the belief that there is one formal standard that supersedes others.
- Though or Another function of Design history is to present students with role models of designers to whose standards they might aspire.

- Design history is a form to combat the tendency to mastery of technical skills and to ignore the deeper aesthetics and social values that ought to underline every design project. It can do so by identifying designers from the past and the present whose work represents a high degree of reflection and integrity. This way students are able to understand that personal qualities are important for the designer, allowing them to see these qualities portrayed in designers work.

The importance of placing the themes within a historical narrative and not entitled “introduction to design” is paramount because the location of a thought, action, object or event in history creates a context for its explanation. When the subject is placed in relation to what came before it and what follows, it is embedded in a nexus of causes and effects that contribute to its identity. For the student, encountering design within history makes the point that design is dependent upon a set of circumstances that create possibilities. The relation between those circumstances and the possibilities for action that designers find in them is essential for students to understand. Through the study of design history, students can relate their own interests to past activities and begin to locate themselves within a community of design practice. One of the arguments that a design history course needs to make is that design is an activity which is valued or should be valued by society. To do this, it has to include an account of important exhibitions, publications, conferences, and examples of design promotion in museums and government, and the efforts of the “grandes écoles”, such as Bauhaus and the H.F.G Ulm, to establish design on a new footing. Exposure to this kind of material should help students orient themselves and their own practices to larger situations than those created by an immediate task at hand.

3.2 Pioneer Faculty

School of Bauhaus:

There is little doubt that the German school of design (1919-1933) was the most influential of the 20th century. Many leading figures were closely identified with it, either as members or staff or students. The emigration of many of its leading teachers to Britain, the United States, and elsewhere following the rise to power of the National Socialists boosted its reputation as a progressive centre of art, architecture and design education. The achievements of the school were recognised by the museum of Modern Art in New York in 1938 when it mounted an exhibition devoted to the Bauhaus from 1919 to 1928. The Bauhaus was founded in 1919 under the directorship of Walter Gropius, bringing together two Weimer art and architecture schools under the title of Staatliches Bauhaus Weimer. The Founding Manifesto of 1919 revealed the institution's ideological links with the crafts and the idea of the unification of all the arts.

In the initial years there was something of an Expressionist outlook, perhaps reflecting the mistrust of many of the avant-garde in large scale industry, which was felt to be partly responsible for Germany's participation in the First World War. At this stage Johannes Itten was a key figure, running the six-month foundation course that was centred on the exploration of materials and form. This was followed by simultaneous studies with an artist, craftsman, and culminated in the study of architecture and building. In the early 1920's there was a very distinct shift of direction with the arrival of the Constructivist artist Wassily Kandinsky in 1922 and Laszlo Moholy-Nagy in 1923. Johnathan M. Woodham (2004, p.39).

The modernising impact of De Stijl and Russian Constructivism was also significant at this stage. For political reasons the Bauhaus was forced to move from Weimer to Dessau in 1925-1926, then to Berlin in 1932 following difficulties with the National Socialist City Council. The school of Bauhaus was closed in 1933. Leading figures of Modernism linked to Bauhaus include: Walter Gropius, Herbert Bayer, Marcel Breuer, Laszlo Moholy-Nagy, Wilhelm Wagenfeld, Anni and Josef Albers, Marianne Brandt and Gunta Stolzl.

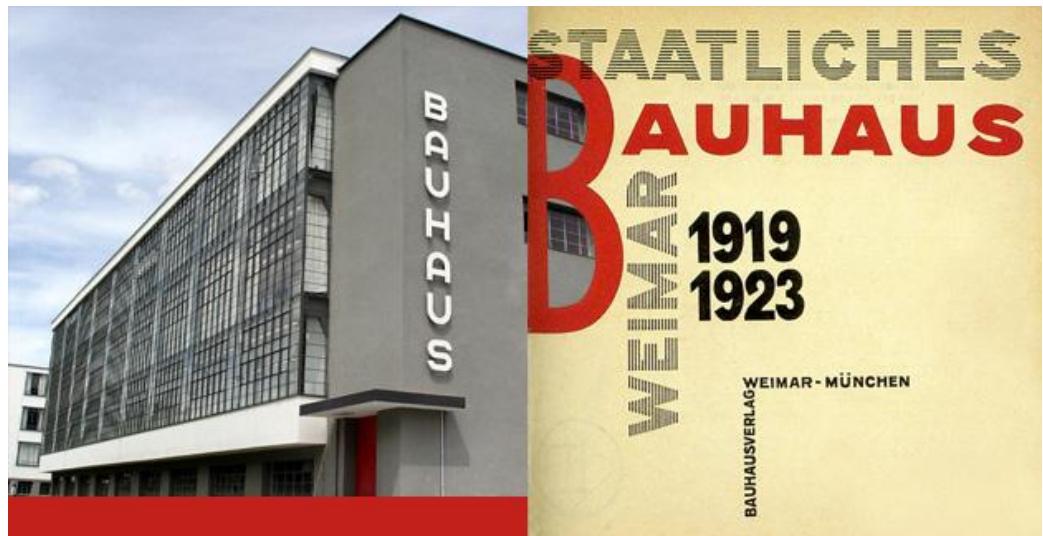


Figure 3.1: Bauhaus Building & Bauhaus exhibit.

Source: Photo by Aart van Bezooyen & Bauhaus 1919-1933 NYC MoMA Exhibit.

Ulm, Hochschule fur Gestaltung (1951-1968):

The school of Ulm was considered as an innovative West German academy that was closely associated with a more scientific, rational, and efficient approach to design after the Second World War. It moved decisively away from the customary reliance on established notions of the supremacy of the creative individual designer toward an approach to design that was concerned with problem solving and the utilization of multidisciplinary expertise. The HfG at Ulm exerted a considerable international impact on design education and practice. It formally commenced in 1953 under the leadership of the architect and designer Max Bill employing former Bauhaus teachers as visiting tutors. However, younger members of the staff at Ulm increasingly questioned the relevance of a curriculum closely linked to what they saw as outmoded ideas of creativity represented by the established Bauhaus approach. They felt that the real needs of contemporary designers were to be answered by a more systematic, scientific, and theoretically grounded approach to design, rather than being dependent on a continued emphasis on studio and workshop centred work. The study of sociology, anthropology, and cultural history, together with grounding in mathematical, statistical, and analytical methods, were increasingly seen as significant elements of the curriculum. Max Bill resigned in 1957, prompted by the increasing influence of the Argentinean Tomas Maldonado. During this period Maldonado was a mainspring in theoretical debates and later became rector in 1964.

Another figure in promoting an intrinsically methodological approach to design was Giu Bonsiepe an Ulm graduate in 1959and then teacher from 1960 to 1968 when the school faced a difficult and situation by the regional government due to political developments of that time and closed that same year. Johnathan M. Woodham (2004, p.428).



Figure 3.2: Works by students of the Ulm school period. (triennale museum, Milan, Italy. 19.02. to 05.04.2009).

Source: images © designboom.

3.3 Brief chapter conclusion - Summary

Without strong roots and fundamentals the design becomes dull, without meaning and nothing more than decorative. Losing our roots and background probably would be the fall point of any discipline and in this sense should be not different for the design discipline. Design history allows us to contribute to the wider discourse of design and helps shape design activity as well as understand the wide cultural context in which designers have worked in the past and in which they continue to work today. For this reason design practice should work hand in hand with design theory, and history allowing the one to complement the other.

Design history asserts that design is an independent practice with its own culture, presenting students with role models of designers to whose standards of high degree, reflection and initiative they might aspire; Therefore understanding that personal qualities are important for the designer and will allow them to see these qualities in designers work. In this chapter two design schools have been presented_(School of Bauhaus and the school of Ulm, Hochschule fur Gestaltung) that exceeded the expectations of their time, for the same purpose; to aspire faculties of today to move toward the unknown and challenge them to overcome boundaries.

4 Chapter- Design as a field of investigation

Designers as well as Design educators can no longer focus simply on the narrow domains of specific applications. They must increasingly reach deeper and more broadly into the foundation of design, and they must understand more about the cultural contexts in which their designs are created and used. In addition, more than ever before, designers are required to investigate and articulate the principles and methodology behind the designs through systematic research, experimentation, intellectual inquiry, and theoretical speculation.

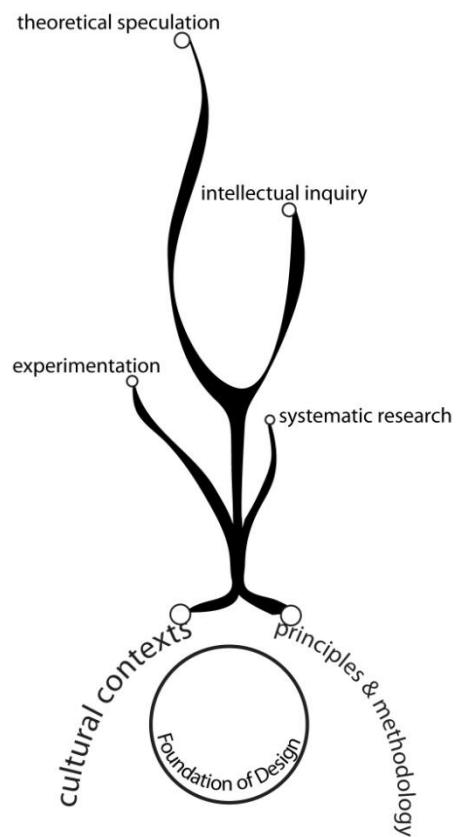


Figure 4.1: Foundation of Design.

Source: Natasha C. Gonçalves.

We face three obvious challenges when it comes to design research:

1. The first challenge comes from within the design field, among professional designers and design educators who ask why design education is needed and what it can contribute to solving the practical problems that designers must address each day in their professional practice.

2. The second challenge comes from outside the design field, among scholars and researchers working in established fields of the natural sciences. Fields which educational methods are accepted with recognised importance for its contribution to knowledge and to diverse kinds of professional practice. These fields question whether design knowledge is possible; what it may be; how it may be achieved in research that it is distinct from, though often related to, research in other fields; and why it should be pursued.
3. The third challenge is how do we find unity in the diversity of our approaches to design and design research?

It is very important to address these questions because of the new circumstances and problems faced by professional designers and by society at large in constructing all tangible and intangible products that surround human beings in our daily lives and strongly influence how we lead our lives.

Design has inherited a century of intense exploration of practice and theory. Design thinking has been applied in the creation of an amazing variety of products in human culture, and we have seen design develop as a professional practice within a remarkable variety of cultural settings around the world. This design evidence has provided a reasonable foundation for diverse hypotheses about what design is and how it may be investigated in research. These hypotheses and theories have been explored in a variety of ways.

The first source is personal experience gained in professional practice and in the forms of design education which place great value on studio experimentation. Though generalization from personal experience, present dangers for establishing a firm foundation for design knowledge this source should be respected because it is concrete and immediate.

The second source of evidence is history. Design history in the twentieth century has provided important continuity of design professions. The narratives of history have helped to consolidate the professions of design practise and shape our understanding of past accomplishments as well as failures.

Design history has contributed to the exploration of design theory providing a necessary grounding for speculations of design theorists, tempering or supporting their ideas with concrete evidence from the past; it has helped frame questions and problems which require theoretical investigation; and it has assembled the intellectual history of reflection on design, the history of ideas within which current and future theoretical speculations must find their place.

The third source of evidence comes from searching – searching for answers to good questions about the nature and practise of design.

Searching becomes research when the questions are progressively more focused in their significance and when the searching is more systematic and controlled. The primary purpose for applied research is discovering, interpreting, and the development of methods and systems for the advancement of human knowledge on a wide variety of scientific matters. Research is an important issue in establishing the legitimacy of design as a field of inquiry. Searching for answers to difficult questions has always been an important part of design practice. Designers are concerned not only with what is, but also with what could be. Their attention is focussed on possibility – the search for new or better solutions to problems encountered in everyday living. In this searching, designers often turn to the work of others to study earlier solutions and to find concepts and methods that may be refined, developed, and applied in new ways. Thus we know that every design is to some extent an outcome of search and research.

We are overcoming a cultural legacy that treated “making” as a servile and inferior activity. Only a few universities recognize production or “making” as a domain of problems and expertise that also requires investigation. There is further knowledge of making – design knowledge that allows human beings to integrate all other kinds of relevant scientific knowledge, as well as the ethical and political values of human beings and aesthetics inspirations, in the concrete reality of particular products. It is this knowledge that we pursue in the field of design, seeking its theoretical foundations, its ways of practical application, and its concrete embodiment in the products of our culture, with increasing understanding of good or bad consequences that may follow for human beings.

To make design knowledge explicit, general, and public, designers and design scholars have engaged in three kinds of research:

1. The first form design history, directed toward the gathering and interpretation of evidence for what design, the practice of design, the influence on design and the results of design have been in the past.
2. The second form the research in design criticism, directed toward the assessment and appreciation of what exists today in products and in current design practices, including the observable consequences of products in daily life.
3. The third form of research is empirical and speculative inquiry- the formation of theories that may bear on the future practice or on the general understanding of design and “making” in human culture. Often draws concepts and methods of other fields, such as psychology, business, anthropology, computer science and so forth. To better understand design and form the concepts and methods of the design field, we will not hesitate to borrow ideas from any source and turn them to our purposes. Our task is to understand the implications of such research, in its breadth, depth, and diversity, for shaping design as a legitimate field of inquiry.

According to Victor Margolin (2002) in his book '*The Politics of the Artificial*': One of the big splits among researchers is between those who seek to ground design research in some notion of disciplinary or domain knowledge that is modelled on the natural or social sciences, and others who prefer a more open and pluralistic approach that includes interpretive methods from the humanities as well. There is also a division between researchers who are focused on pragmatic ends such as design management or design for manufacturing and those who design research is a more speculative enterprise. The lack of a shared community among all design researchers has also been a factor in design education.

Understanding of the term ‘research’ in the field of Design

Christopher Frayling (1993) approaches the debate about the nature of research in art and design from a linguistic point of view. Suggesting that the way in which we employ language in our discussions affects the connotative meanings of the words, applying not only to the meanings of terms such as ‘research’, ‘practice’ and ‘work’ but also to their grammatical construal in phrases such as ‘*research in to practice*’, ‘*practice-based research*’ and ‘*work of art*’.

According to this idea language constructs the concept of research which would be a ‘constructionalist’ interpretation rather than a descriptive one. This constructionalist approach raises the question: **To what extent is the debate about research in art and design affected by language?** The author using his own methods for establishing how many of our prejudices and assumptions have their roots in our use of language was able to identify some symptoms: The outcomes of research must be explicitly communicable to others, that practice includes writing, design, science, etc, and therefore cannot be used to differentiate these activities, and that it is the relationship of ‘research’ to ‘practice’ as shown in the construal of the terms ‘research- into a practice’, research-through a practice’, and ‘research- for a practice’ that can show us their instrumental relationship.

“When we regard words as instruments, we focus on their use and on what is achieved when we employ them. In this context we might regard the word ‘research’ instrumentally if we attend to what it meant by a community of users of that word, ‘not with a view to discovering anything about the nature of the objects to which they seem to refer; rather than, to find out whether there are such objects, and if so which objects they are” Hunter (1990 cited in Michael A R Biggs , 2002, p.3).

Frayling’s conclusion is that the term ‘research into’ can be employed when qualified by a prepositional triad of “into, through, for”. The example of ‘research-into’ art and design include historical and theoretical perspectives. His examples of ‘research-through’ art and design include materials research and action research. When referring to ‘research-for’ art and design the author finds problematic because its examples would have to include artefacts that embody the thinking but fail to make explicit their own knowledge and understanding.

4.1 Obligations and Objectives of Design Research

According to Nigan Bayazit (2004) in her paper ‘Investigating Design: A review of Forty Years of design research’; the obligations that Design research has toward the humanities are defined:

- Design research is concerned with physical embodiment of man made things, how these things perform their jobs, and how they work.
- Design research is concerned with the development of man-made things as a human activity, how designers work, how they think, and how they carry out design activity.
- Design research is concerned with what is achieved at the end of a purposeful design activity, how an artificial thing appears and what it means.

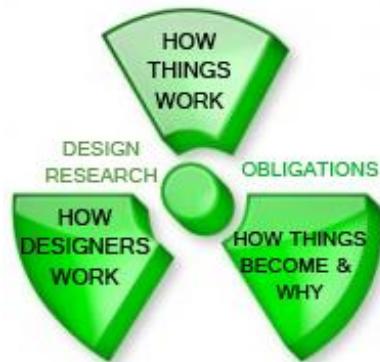


Figure 4.2: Design research obligations.

Source: Natasha C. Gonçalves.

In the same paper the objectives of Design Research are also defined: the study, research, and investigation of the artificial made by human beings, and the way these activities have been directed either in academic studies or manufacturing organizations. Therefore this current study could be considered a small contribution to Design Research, as its one of its objectives is to investigate through undergraduate design curriculum analyses: How design activity has been directed in academic studies.

Although the information we search for may not be as straightforward in the area of design as it may be in other sciences, it is still identifiable and visible in many disciplines. Since the 1920s the roots of design research are found within the Bauhaus, which was established as the methodological foundation for design education. After the Bauhaus closed, most of the staff moved to the U.S., Britain, or Russia, where they were well accepted and took the Bauhaus tradition to other institutions. Moholy-Nagy moved to the U.S where he finally became the director of 'New Bauhaus,' which became the Institute of Design at the Illinois Institute of Technology in 1940. Gropius went to Harvard, and brought a new line of thought to that side of the U.S.

4.1.1 Design Methods

The design methods movement attempted to establish a broad research culture for design. Members of this movement were primarily active in Great Britain since the early 1960's. In 1967 the symposium, hosted in Portsmouth Polytechnic where the organizers set up a confrontation between two groups, the first identified as 'behaviorists' and the second as 'existentialist/phenomenologists'.

This First Generation of Design Methods which characteristics were defined at the Design Methods conference organised by J. C. Jones and D.G. Thornley (1963) in the U.K included a more scientific approach to design based on critical analysis and the separation in to two poles that was made in the quest to find neutral techniques for the measurement of human behaviour and, on the other, by an attempt to foster a unique individuality in each person which led to many figures responding negatively and raising concerns to the polarization that also led to many leaving the movement such as Christopher Alexander and John Chris Jones.

Other design method conferences were held during the 1970s into the early 1980s. Bruce Archer during the conference of the Design Research Society held in 1981 proposed that an agenda for design research that included no less than ten categories. This idea was based on the belief that a body of pure knowledge could be discovered by dividing design into a series of topics, each of which would yield its own truths.

This Agenda included Design taxonomy that focused on the classification of phenomena in the design area; design praxiology that refers to the nature of design activity, its organisation and apparatus; design philosophy which was the study of the logic of discourse on matters of concern in the design area; design epistemology was to be concerned with identifying special designerly ways of knowing, believing, and feeling. Although this was an important step for design methodology, the idea that design knowledge would be deepened if it were grounded in a field of science-like inquiry undertook a lot of criticism because it was suggested that a scientific investigation based design research would miss the point of how potentially diverse design research might be. Thus leading to the Second generation of design methodology which was an Issue Based Information System (IBIS), this was problem identification methods, user involvement in design decisions and identification of their objectives influenced by the British philosopher Karl Popper.

J. Broadbent (2003) examines the relationship between design and science through the lens of methodology with purpose to foresee the next generation of design methodology and its attributes. Four methodology generations are recognised: craft, design-by-drawing, hard systems methods, and soft system methods.

Craft methods characteristics (approximately 258.000 years ago):

- Craftsmen did not, and often could not, draw their works and neither could they give adequate reasons for the decisions they took
- Product information was instead stored in the form of the product itself and was transmitted through apprenticeship
- As neither the product nor the reasons for its form were recorded symbolically (e.g. by drawing), change could only occur through experimentation
- As a result, responsiveness to environmental change tended to be gradual
- Thus, the form of an artefact was modified by trial-and-error over many centuries, in a slow and costly process.

Design-by-drawing methods (approximately 558 years ago):

- Design became separate from production
- A division of labour within design emerged, especially for large and/or complex projects
- The ‘perceptual span’ of designers greatly increased; they could not only manipulate the design as a whole but could also easily import work from elsewhere
- For these reasons, design changes could be more substantive and accomplished in shorter time frames.

Hard systems methods (HSM) (approximately 48 years from today):

Benefits

- Improve response to growing complexity of design task by: changing design emphasis from individual products to product systems, broadening purview from local improvements to “the total situation”, incorporating more effectively other inputs into design process (e.g. ergonomics), allowing a more structured search of rapidly growing search spaces, and managing better the interdependency between system levels.
- Help concurrent / collaborative design, by: making design thinking explicit, and engaging other minds at critical stages in design process
- Help designers to better meet shorter timelines, by: reducing design error, making easier the anticipation of side effects, and lessening possibility of unintended omissions.

Limitations

- Difference of intentions of scientific and design methodologies
- Different approaches of science and design to problem solving

Soft system methods (SSM) (28 years from today):

Benefits

- Process characteristics: a systemic as well as systematic approach to problem solving, oriented to learn rather than just goals-seeking, providing structure to fuzzy / ill-defined situations with different perceptions and views, making beliefs and viewpoints open and explicit/ thus admitting a number of viewpoints into the problem space, tends to

generate shared understandings of problems, identifies 'emergent' potential situations, and embodies Schon's notion of reflection in action.

- Problem characteristics: assumes that the world will remain problematical, but can be better understood and interacted with by using system models, thus talks about 'issues' and 'accommodations' rather than 'problems' and 'solutions', and is well suited to the resolution of complex problems.
- Scope of method that draws attention to cultural aspects of a problem, includes all of stakeholders in a problem situation, keeps in touch with the human content of problem situations and thus extends the problem solving capabilities of HSM into the social and psychological domains.

Limitations

- Challenges worldviews because of participant necessities that are needed to 'see the world' and challenges of the power structures and politics
- Less formal (subjective), never independent of the user, can't produce final answers, aims to satisfy rather than to optimize and is interpretive rather than functionalist.
- Unfamiliar requiring a way of thinking that is not always immediately evident to users, and the methods can be time consuming and need experience to apply.

Each of these generations are characterised in terms of its benefits and limitations in respect of design practice. Broadbent suggests that a fifth generation in design methodology is now emerging and that the development of this new generation will position design as an evolutionary guidance system for socio-culture, a much more central role in human affairs; also having the potential to generate a profound and comprehensive relationship between design and science.

4.1.2 Design Research Society

Design Research has a long history where many individuals have published on the subject. Yet despite these efforts, the degree of interest in research among the design disciplines has been quite uneven, ranging from more than a little in engineering design, to some architectural and product design, lacking much in the field of design most closely associated with the arts and crafts. In other words, when compared to what is normally encountered in the sciences, humanities and other scholarly disciplines, there had been a shortage of 'classic' research. This was one of the main reasons the Design Research Society was formed forty years ago and celebrated with a symposium to reflect the development of design research and stages of its journey. The main objective of the of the Design Research Society was to cast design as a science, justify that design was worth study, acquired intellectual thought, was partly formalised, partly teachable, and not just a result of intuition and artistic approaches. Comprising the fundamental issues of knowledge and understanding which determine any area of study. A subject becomes understandable when it can demonstrate that it exists as a real phenomenon; when it can explain what it is; when it can explain how it is different from other subjects and, therefore, deserves treatment in its own right; and finally, when it can explain why it is the way it is.

Table 4.1- Design Research Society - holders of the Chair:

1967-69	John Page
1969-71	William Gosling
1971-73	Chris Jones
1973-77	Sydney Gregory
1977-80	Thomas Maver
1980-82	Nigel Cross
1982-84	James Powell
1984-88	Robin Jacques
1988-90	Bruce Archer
1990-94	Sebastian Macmillan
1994-98	Conall O'Cathain
1998-06	David Durling
2006	Chris Rust

Honorary President:

1992-00	Bruce Archer
2000-06	Richard Buchanan
2006	Nigel Cross

The Design Research Society (D.R.S), established in the 1967 and based in Great Britain, embraces a large range of scholars and professionals who are interested in design research. This society has an international network in more than thirty-five countries that is composed of researchers with diverse backgrounds ranging from design and art to engineering, psychology, and computer science. According to the society's promotional literature, its goals include encouraging communication across all design disciplines, supporting the improvement of design performance, and contributing to a coherent body of scholarship and knowledge in design. The D.R.S has been making efforts to broaden its range of interests which is evident in the promotional literature for its September 2002 conference entitled 'Common Ground' that sought to attract researchers working in a full range of fields from design history and eco-design to design management and artificial intelligence.

Professor Ken Friedman (2002), talks about the future of design research. Design and its numerous sub-disciplines are considered to operate in an environment that spans levels of economic activity.

Designers have a moral responsibility to consider the consequence of this future for the billions of people who live at level zero, with no economic influence. Beneficial design is for world again.

4.2 When Design research meets Design Education

In recent years interest in design research has spread to mainstream circles in education research. It has been advocated as a mode of educational inquiry that not only provides systematic means for devising and refining novel learning and teaching environments, but couples this with the development of contextualized theories of learning and teaching. (Design-Based Research Collective, 2003; van den Akker, Gravemeijer, McKenney, & Nieveen, 2006). According to the article 'Design Tools in Didactical Research: Instrumenting the Epistemological and Cognitive Aspects of the Design of Teaching Sequences' by: Kenneth Ruthven, Colette Laborde, John Leach and André Tiberghien, where they seek to contribute and develop a public repertoire of theoretically informed tools what was termed *didactical design*: the design of learning environments and teaching sequences informed by close analysis of the specific topic of concern and its framing within a particular subject area.

Interest in Design Education has gone hand in hand with the growing attentiveness to design research, an activity with a wide scope whose objectives and methods are just being articulated.

Nigel Cross (2000) has claimed that if the ultimate goal of research is to create knowledge, then the goal of design research should be to develop, articulate and communicate design knowledge. According to him this knowledge resides in people, processes and products, and therefore design research should investigate how people design, what the strategies and techniques of designing are and what forms and materials are embodied in design attributes. There are two main approaches for this: The first is Research in to Design and the second is Research through design. In other words, the first approach studies the discipline of design, including traditional historical and aesthetic studies, while the second approach utilises research through practice applying design methods and processes, and produces knowledge through artefacts, models and concepts.

In correspondence to the ideas of Nigel Cross (2000), Gibbons (1994 cited in Kirsikka Vaajakallio & Kati Vehmas, 2008, pp.18-20) presents two Modes to produce knowledge through research which two modes do not replace each other but differ essentially especially when it comes to the context of knowledge creation, contributors, nature and objectivity of the knowledge, the results and relevance of the knowledge. Mode one, is the traditional academic type of knowledge production process; which creates theories outside the practical world, and is tightly connected with the academic rules and ideas. Charles Owen (1998) Research should not be thought of as being limited in form, in particular, to the classical forms of scholarly and scientific research.

The author Charles Owen (1998) states that those forms of research, as processes of knowledge using and building in the service of inquiry, are practiced by nearly all disciplines, but to greater or less extents. He continues by proposing that Knowledge using and building for the purposes of application is an equally productive process, adding to a discipline's knowledge base through the contribution of worked examples; a corollary lesson from this reflection is that balance may be useful.

The second Mode by Gibbons (1994 cited in Kirsikka Vaajakallio & Kati Vehmas, 2008, p.19) emphasises knowledge that is needed and created during the problem solving process and states that everyone working with the problem can contribute linking this mode to the transdisciplinary research and knowledge, and can be positioned outside of the traditional academic disciplines. It also differs from interdisciplinary research, which refers to cooperation within different academic disciplines sharing the same problem. Interdisciplinary research has found main characteristics, which are also typical for trans-disciplinary research; usually operating in multi-methodological fields, with a range of goals, addressing broad issues, and exploring relationships crossing disciplines and professions. One of the main challenges in interdisciplinary projects is to deal with versatile participants and various goals. According to Gibbons (1994 cited in Kirsikka Vaajakallio & Kati Vehmas, 2008, p.19) the aim to produce new practical knowledge leads to transdisciplinarity.

Suggesting that Mode One and Mode Two should happen simultaneously completing rather than discarding each other. As has been stated by Kaasinen and Norros in 2007, there is a need to combine research with practice of design in new ways. They propose that Mode Two type of contextual, collaborative and diverse knowledge production processes for developing interactive environments. To reach new solutions and satisfy various parties, the process should produce both practical and theoretical knowledge, and through the continuous implementation of that knowledge guide the process further. Transforming the experiences through the process into explicit and visual formats supports the reflection on what has been done and learned. This for one enables creating a platform for continual knowledge production that engages multiple participants.

Bruce Archer (1984 cited in Luck Rachel, 2006, p.1) emphasised the importance of education; design in general education, in schools, to children, to everyone. 'Design has its own things to know, ways of knowing and ways to find them out'. He also produced a collection of essays emphasising design as an activity that is common to many disciplines.

Victor Margolin (2002) in his book '*The Politics of the artificial*' states that design studies should be brought in to the academia as a research field, admitting that the traditional boundaries in the humanities and social sciences that were established in the nineteenth century were collapsing. This situation as it relates to the social sciences was addressed in an interdisciplinary study that was undertaken in the early 1990's entitled '*Open the Social Sciences*:

Report of the Gulbenkian Commission on the Restructuring of the Social Sciences' which approached the issue of how design research might be organized within a university setting. The study makes four recommendations that support the type of academic arrangement that would work for design studies. Although our current study is focused on the undergraduate level of design studies, changes that were proposed of doctoral and post doctoral research in the '*Open the Social Science*' report help enlighten the situation for our focal point. The recommendations made from this report were: the expansions of institutions that can bring scholars together for short periods of time to explore specific themes;

The establishment of integrated research programs within universities that cut across traditional lines and have funding for limited periods of time; and the appointment of professors in more than one department. The author argues that design studies need a place where researchers who are developing its different strands can engage each other, referring to the Gulbenkian Commission report that provides an excellent precedent for thinking about how a new productive design studies community might be constituted in academia. This report also suggests that such a community should operate outside the class room as well. Such a model currently exists in well-established disciplines such as sociology, literature, or art history. In the United States, for example, the College Art Association embraces a number of affiliated societies that meet on their own during larger annual conferences although the society members participate in the general conference sessions as well. The Collage Art Association, as with similar associations of sociologists, anthropologists, or literary scholars, is a place where new issues are introduced and debated.

4.3 New Fields of Design Research

'Epistemology of Design Knowledge and Theory'

The focus of 'Epistemology of Design Knowledge and Theory' is to look at the epistemological characteristics of knowledge and theory relating to design and by making theory using these epistemological characteristics, improve design practice, theory and research. This 'new' field of Design research focuses on the 'Epistemology of Design Knowledge and Theory' and its application in design practice, design theory-making and design research. Studies by Dr. Terence Love, shows that till now it is a missing field generally in Design Research, Design Practice and Design Education.

A practical example is to look at the epistemological characteristics of for instance a group of design problems. The approach contrasts with the traditional design research and design practice approaches in which the focus is primarily on the concrete aspects of content and contexts of design situations.

For example, the focus was 'Design problems associated with people's interpretation of medicine bottle labels'.

A typical design / design research approach would be to look at the characteristics of the labels (fonts, layout, colour, etc) and to look at the context (how they are used, the users, user behaviour, success in interpreting the labels, etc). More advanced approaches might include theories about cognition, social construction of knowledge, affordances and other.

An approach from the field of 'Epistemology of Design Knowledge and Theory', however, would be to stand back one or more levels of abstraction and look at the characteristics of the theories we use and make about this situation. The focus would be on the epistemological characteristics of theory and practice of interaction in this situation and creating coherent models about the structural relationships of these theories into a situation 'type'. This would be an epistemologically-based model of the theory structure of the situation. The approach is important because it is epistemological similarity that allows us to justifiably transfer knowledge from domain to domain, design situation to design situation, and to avoid design research and design practice being blinkered by being context and content specific.

The purpose for looking at the epistemology of the knowledge and theory of design situations is useful according to Terence Love (2002), on at least six counts:

1. Because the behaviours of any design situation are more transparent (if you have the ways of looking) in ways that are much more powerful than the more blinkered approach of focusing only on the concrete issues of design content and context.
2. Understanding the behaviours of design situations in this way is much more powerful than traditional approaches based on design principles, elements , context and user characteristics.
3. It is easy to draw on knowledge and findings about epistemologically similar design situations in completely different fields in which the design situations and contexts are not similar in the concrete.
4. It can become almost trivially easy to identify types of design solutions likely to be successful to many complicated design problems that would commonly be called 'wicked problems'.

5. It points to approaches that will improve on existing research approaches and design practice.
6. It provides a sound basis for optimising design solutions and design research approaches.

Current talks are discussing if the 'Epistemology of Design Knowledge and Theory' should remain limited to issues internal to design research, or if it should aim higher - to the field of research in general.

Kari Kuutti (1991) from the University of Oulu, states that "*if design research wants to be recognized as a discipline among other it has to prove its worth, be unique in a way that is accepted by others*". There are various ways to that, and related issues have been and are constantly discussed also within this forum. But one of the most powerful arguments has been left almost unused, exactly as Terry observes: epistemology. The 'researcher' has the position of an external observer; he or she collects data without disturbing the research subject, and neutrally manipulates it and interprets the findings.

The author continues by proposing that: 'Design research epistemology' starts from a completely different position. If there is something fundamental in design everybody agrees, it is that design changes the world; therefore design research by necessity has to cope with purposeful changing of the world as means to provide new information, as an epistemological device. This is a significant difference, and definitely enough to build a unique epistemological position on. It is not a novel invention - John Dewey made the point forcefully in his 1929 Quest for Certainty lectures - but its implications for research are still to be worked out. He finalises he's proposal by mentioning that "*The epistemological position of design research is in fact a healthy one: changing the world is one of the strongest, and, in the end of the day, maybe the only way to make the world reveal connections, mechanisms, forces that lie below the observable surface of reality. At least that was what our colleagues in high-energy physics found out eighty years or so ago when they stopped pure observing and started to build their first accelerators.*" John Dewey (1929, in Kari Kuutti, 1991).

4.3.1 Capacity of Design in the 21st century

The information in this sub-chapter has been filtered and gathered from my own notes taken at the Clive Dilnot (2010) lecture that took place at the department ISCA of the University of Aveiro.

On April 15th 2010, **Clive Dilnot** gave a lecture on the **Capacity of Design in the 21st century**. This lecture was held at the University of Aveiro in the department of (ISCA) and approached this subject with an argument on how through the artificial world, as it does not obey laws of a higher source may lead us to becoming more human as beings rather than being bound in to the artificial. In order to prepare for a better future and overcome the misery of the past and present, Clive Dilnot tries to answer the question: How do we become adequate to the problem? Suggesting that the answer lays in the acceptance of the current and past situation as a fact and as our responsibility.

Only then are we able to act toward a solution. He continues by formally addressing human action up to current date:

- Domination and exceptionalism (man dominates all in world)
- Enframing (man objectifies the world and does with it as he pleases)
- Standing reserve (the forester)
- Effecting – Power and organization
- Equipping (everything becomes mechanis)
- Consuming (aimless activity of using things)

Also specifically addressing the loss of control of a technology that has become autonomous because human beings have allowed it to become a source of uncontrolled temptation, where man makes but what he makes does not truly represent who he is. Our current situation is that as humans we are disconnected from the nature of things, constantly loosing essence and touch.

So how can Design help us to combat this situation and help lead us to a more optimistic future?

Professor Clive Dilnot suggests the ‘Re-direction of Action’ by:

- Make time differently than we have in the past (see possibilities inside history).
- Create a new way of acting- activity (create acts that will change the past and lead to a new direction).
- Continuity of man plus world plus things (accept catastrophe but work against it).
- Defining the good in ethics of things as well as persons.

How does this relate to Design? The Professor suggests that design has been designing within categories e.g. the DVD player is designed within the category of home entertainment. That design needs to think beyond critique in order to see new possibilities, embracing critique in order to evolve. Through this new form of thinking and acting, design will link the artificial (man-made things & symbols) with possibility and transformation. As a result the artificial becomes our interface, normative, allows us to understand action better, and projects the complexity of humans and their relationships with the world.

To defend this idea he refers to several authors, such as: Gianni Vattimo (1991, p.26.28) The end of Modernity p.26.28), Julia Kristeva (1989, p.221), The Black Sun, Martin Heidegger (2005) Overcoming Metaphysics).

4.4 Brief chapter conclusion – Summary

Design research has helped eliminate doubts that other established fields might have about whether design knowledge is possible; while establishing design as a discipline as its own right and to make it stronger than just an imitation of some other field.

But design research is not only helpful as proof to outside fields, it allows those within the design field to better understand Design thinking. Understand what it is that designers do when practicing design. This knowledge is valuable to the design student to better understand the design process and develop cognitive skills such as the ability of constructive criticism that will lead to improvement. Such skills should be taught to every educated person and be included as general knowledge independent of their field, the same way it is valuable to have knowledge of literature or science.

5 Chapter –National and international Universities & Academies

Institutions in higher art and design education are by nature organizations which value learning and creativity. This Chapter has been based on a Project realised in the beginning of the year 2003 and had the duration of two years, focusing on the theme ‘Governance of Universities’. The project involved several scholars and professionals of the Portuguese public life.

5.1 The mission of the University

The University, which original mission was to satisfy the quest of knowledge of some, educating as well as training of the elites and the Church. Today responds and adjusts to the many appeals of new societies. There for the idea of ‘University’ has evolved since its birth in the Middle Ages, in such way that the Newman University, the University of Humboldt, the American University, or current University of the United Kingdom are various models of adjustments of the institution of the university to different epochs, societies, cultures, historical and political contexts, so much that, in 1963, Clark Kerr called it Multi-diverse.

Not only has the mission of the University changed in this setting. But also in the university's mission lies the answer to the diversity of demand functions of education and training for institutions of higher education. Other structures and institutions were born and consolidated. In Portugal, we recognize for this purpose the polytechnic institutions, a name which was inspired by a diversification of models adopted in the UK. We can, in any case, consider that this evolution has led it to the following functions in higher education:

- Higher education and training of different natures, durations and vocations, including post-graduate;
- Scholarly study, search and creation of knowledge;
- Fundamental investigation, inserted into international networks of excellence;
- Applied research and services that are advanced to communities, to ensure transfer of knowledge.

In this context, how could we identify the specific mission of the University? At this institution, it should be within its responsibility of being the centre of creation and dissemination of knowledge in the research environment, free and committed with transparency and truth-seeking legitimized by science. Public universities, in particular, have the important mission of guarding principles and values that are the nation's heritage, to predict risks and to study and discuss issues crucial to human development in an environment of freedom. Is also for them to ensure that higher education and research that support the national capacity to provide knowledge in areas that do not necessarily involve economic interests.

In brief, it is said to be that the fundamental mission of universities in Portugal (national), as in more developed countries (international), provide education and training, and train researchers, professors of higher education and other frameworks for professions that use advanced knowledge intensively; as well as be a reserve of culture, scholarly knowledge, debate and free thought and independence.

Several logics are thus present when you want to point out the mission or missions of the University:

- National needs for professional managers at high level in a variety of areas.
- The demand for autonomy and identity and the vocations of students.
- And even, its own logic, a rigorous search of knowledge, which should not be separated from the national interest and social existence of strong competencies in various areas of culture, science and technology, and dissemination, application and transfer of knowledge associated with these areas which impact the culture and economy of the country.

5.2 Educational systems and governance in higher education

In other countries, the issue of diversification and differentiation of education, and undergraduate education has been the subject of attention of investigators and other experts of Superior education.

This issue, which has attracted interest from scholars and politicians, is also present in the references and confusion about the distinction between polytechnics and universities. There has been a lot of focus on Research Universities when we refer to the system of higher education in America, but there is little reference to community colleges, whose courses last two years, and are attended by over 60% of students on a undergraduate level in that country.

France, decided in 1985, to establish two objectives for the period of fifteen years: to provide some form of recognized training to all young people. To have 80% of young people complete secondary school. The creation of the vocational *baccalaureate* in 1985, was considered a fundamental instrument to achieve the above two objectives. This diversification secondary education will not be separable from the distribution of students by the various alternatives of superior education (1994, 60% of students completed their *baccalaureate* and were part of long programs. The remaining 40% were involved in short courses, when ten years ago only 25% chose the short programs) Júlio Pedrosa and Filipe Queiró (2005, p.47).

Polytechnics in the United Kingdom, which Portugal was inspired, has its origins in the recovery of professional, technical and the industrial revolution, keeping alive the debate and controversy over the effects of standardization operated in 1992. This decrease in diversification of British higher education originated 100 universities. In 1996, 60 other higher education institutions and 400 further education colleges with significant involvement in higher education, received at that time, 10% of students enrolled at this level of education. Júlio Pedrosa and Filipe Queiró (2005, p.47).

Thus, until the late nineties of the last century, education systems across Europe and the United States began to stratify into three broad types, despite its nomenclature varies from country to country:

- Traditional universities – multidisciplinary institutions, rooted in academic knowledge, research and theory. Conferring degrees of Bachelor to PhD with some examples of good practice based courses in arts and culture, historically situated in such institution until the 1990s.
- Polytechnic (also known as universities of applied science in some countries) - multidisciplinary institutions primarily concerned with vocational training through the acquisition of skills closely linked to the demands of a professional world. Confer Bachelor's and Master's degrees, and sometimes (but not in all countries) doctorate programs.
- Colleges and "*monotécnicos*" - Institutions that specialize in the practical teaching of arts and culture (often private) which sometimes included a wide range of vocational subjects. Teaching include mainly technical training, and preparing for a profession.

5.2.1 The situation in Portugal (national)

Nationally, the genesis of higher education in design started in the private sector, in 1969, when the IADE created the course "Interior Design and General Equipment" - "*Design de Interiores e Equipamento Geral*" with a duration of three years and performed according to the model Arts & Crafts of the Anglo-Saxon and schools as the '*Scuola Politecnica di Design*', Milan. The introduction of public higher education in design occurred in 1975/76 in the '*Escola Superior de Belas Artes*' in Lisbon (School of Fine Arts) and School of Fine Arts in Oporto (ESBAP) with cycles of five years. From then until now, the higher education institutions that provide training in design multiplied throughout the country. Júlio Pedrosa and Filipe Queiró (2005, p.48).

The discussion of educational systems and governance of universities in other institutions of higher education interested in higher education has been the target of great attention in the international media, and this is on the agenda in our country as well.

Some of the important reasons why Portugal should enter the theme of governance in the list of challenges of higher education as in other countries are:

- The continued increase in frequency, accompanied by changes in the idea and mission of the university;
- The increase in required resources and the associated tendency to diversification sources of funding.
- The growing interest in research findings by business and other representatives of the economic world;
- The changes in the principles and values that lead to the action of the State and public service;
- The pressures to introduce ideas and practices associated with management, with competitiveness, transparency and evaluation that will provide all of the governance and public administration.

We are therefore related to significant changes in a context in which universities operate and in the expectations on how to organize and govern the systems and institutions. Despite advances in recent decades, much can be done to improve the government of the University of Portugal, whether in the system is in the individual institutions. It is certain that Portugal has a degree of diversification in higher education.

However, the light of the laws that fall on the level of higher education and on practises known, the system does not yet meet all requirements that are demanded: a clear and careful distribution across sectors and institutions, the full range of functions and objectives of a modern network of tertiary education must satisfy. The clarification of what is intended with the network of third level education in Portugal, would contribute to the understanding of conditions that allow each institution to be responsible for assuming a specific mission, set forests, plan responsibly their mid-term program and ensure its execution without disturbances or unjustified changes in the guidelines which govern their actions.

Higher education of design in Portugal grew slowly initially, but sustained. However in the last decade there has been an exponential growth in terms of educational institutions, offering training to a number of students.

According to Carlos Aguiar Pinto (designer and assistant professor), who looks at Pedagogy as a research device on the design core; He announces that the model prevailing in the 18 design schools (2001) active in Portugal is based on a hands-on type of logic: specialties are the result of branches that follow product typologies such as interiors, fashion, graphics and product. Pointing out that what are most valued are the specific skills that support the immediate application of project capacity in a particular domain. However Carlos Aguiar brings to attention that, what is read in professional reality of design contradicts the mentioned pedagogical approach and increasingly emphasizes the horizontality of 'project thought' and its positioning as a field that is healthy contaminated by anthropological reflection and technological development.

He continues by suggesting that whether considering Design as problem solving through drawing and means of incorporating culture, or solely as an effort to quality interfaces, which are definitions that emerge from researching the characterization of a sole field of design, and from a curricular definition of its design core. Mr. Aguiar states that a new course is a privileged situation of research that entails an empathic understanding of the above mentioned core, since it allows, under a controlled universe and known parameters, the direct study of the influence that specific conceptual framework has on the actual design practice that it entails.

Items developed through communication stated by C.Aguiar:

- The subjacent meaning of territory and specific forms of design.
- The curriculum-based structure that supports it.
- The definition of observation/evaluation parameters for operational results.

The above elements were used to structure a thesis on a new global reading of the design phenomenon as explanation/ construction of material culture. In 2001 these elements were applied, tested and put forward at the University of Aveiro.

Assistant professors to the above work include: Professor Francisco Providencia, João Branco, and Professor Vasco A. Branco.

5.3 The Bologna Process

Beginning in May 1998 and inaugurated in June 1999, the Bologna Process has the clear objective, of until 2010 creating a higher education that is compatible, harmonized and that will promote the mobility of students & teachers, and to increasing employability throughout Europe. The Bologna Process begins with the signing in Paris, followed by the Sorbonne Declaration in May 1998 by the Education Ministers of Germany, then France, Italy and the UK. In June 1999, twenty-nine European countries signed the Bologna Declaration among which included Portugal. In May 2001, following the Bologna Declaration, the European Ministers of Education meeting in Prague added three more lines to the action of the Process: Promoting lifelong learning, greater student involvement in the management of institutions of higher education and promotion the attractiveness of Europe. In September 2003, thirty-three European countries meet in Berlin in order to evaluate the process of building the Higher Education in the European Area. As a target, by 2005, the application of the ECTS and the Diploma Supplement was established, the strengthening of synergies between the European Higher Education Area and Superior Research, defined as fundamental pillars of the consolidation of the Knowledge Society. *Daniel Raposo & João Vasco Matos Neves (2009).*

In 2000, the Lisbon Strategy stresses the need for the establishment of Higher Education in the European Area, which would be coherent, consistent, competitive and attractive to European students and third countries by 2010. One of the normative documents that have implications for the organization of design courses of study is Decree-Law No. 74/2006, which approves the legal regime of degrees and diplomas of higher education, regulating as amended by Act Education System for the new model of higher education. The diploma is structured in five main headings:

- I. Academic degrees and diplomas of higher education;
- II. General principles which makes the process of accreditation;
- III. Rules to apply to the reorganization of established programs;
- IV. Transitional rules to be adopted for the creation of new courses of study up to the creation and entry into operation of the accreditation agency;

- V. To adopt rules for the registration of changes, including those relating to the curricula of courses.

The adaption of the Bologna process to design courses developed in the 2004, with the report in the Area of Knowledge in "Art and Design" which was an integral part of the project plan for implementation of the Bologna Process at a national level. It was intended to create a base of support in the establishment of knowledge and skills, to acquire specialty and education systems, as in the exemplification of classifications and the structure of educational curricula.

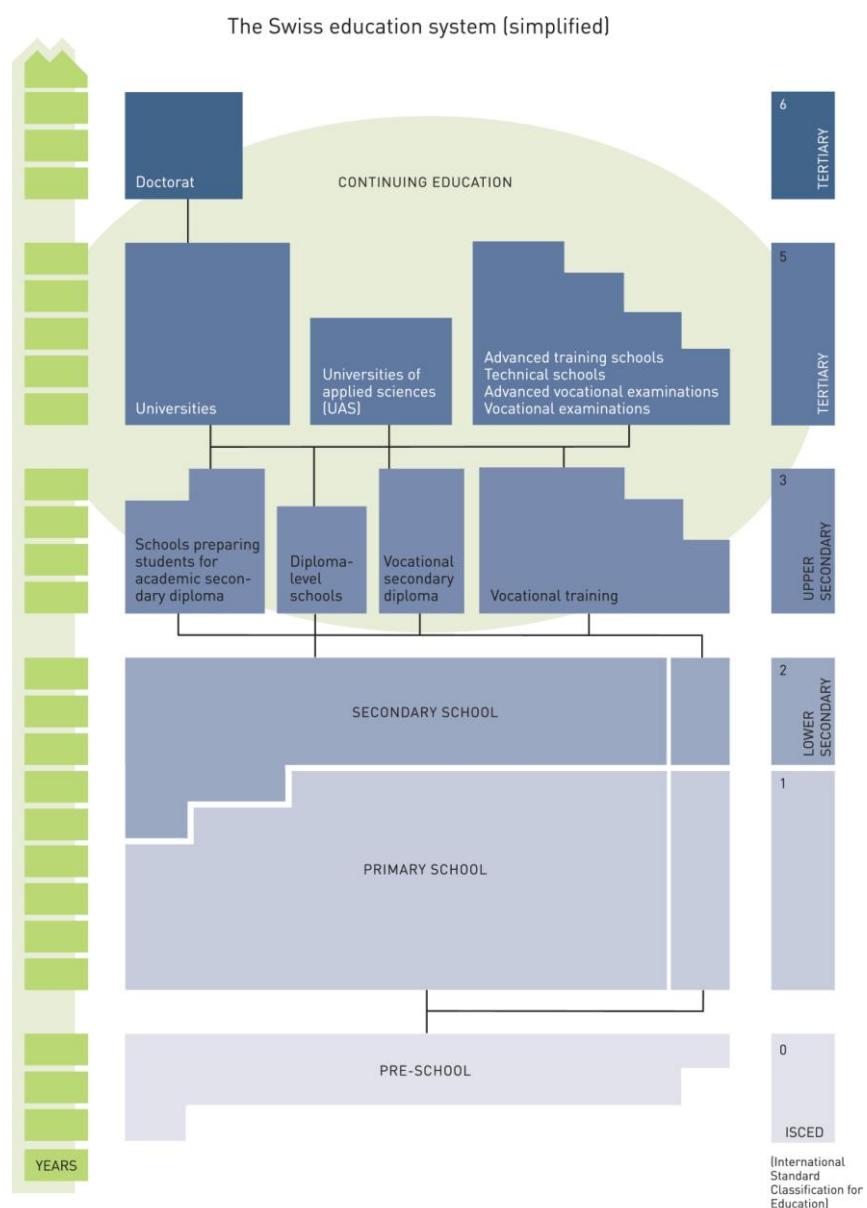


Figure 5.1: The Swiss Educational System

Source: Swiss Conference of Cantonal Ministers of Education.

5.4 Brief chapter conclusion – Summary

All new courses of study, educational models and curricula have to adopt traditional rules and regulations of educational systems as well as follow general principles which make the process of accreditation. Recently the Bologna Process (1999) has been inaugurated. This process aims to create a higher education that is compatible, harmonised and that will promote the mobility of students and teachers throughout Europe. Therefore it is crucial that new courses adopt rules for the registration of changes, including those related to the curricula of the course and respond to external government driven requirement.

6 Chapter – Design curriculums

Programme leaders need to identify key issues to discuss with their teams; areas that require thought and resolution before students start the programme. There are many pressures on creating a curriculum; whether it is responding to external requirements, professional or government driven, incorporating initiatives, delivering content and developing learners. Very few programme teams are able to start from scratch – most programmes are developed from existing programmes and modules. Even within these constraints there are fundamental questions that need to be debated.

Although there is no agreed definitive list of principles of when creating a disciplinary curriculum Liverpool John Moores University creates a list of a few useful set of principles that need attention:

- Holistic and coherent
- Inclusive / accessible / student centred
- One that fosters a deep approach to learning,
- Encouraging independence in learning
- Based upon / has links to research / scholarship
- Based on feedback, evaluation and review.

Also taking in account:

- Its market / its intake / its output
- Its learning environment / resources / staffing
- National requirements.

6.1 University of Aveiro – Study Case

We turn to the University of Aveiro to provide us with a conceptual structure that will stand as a point of comparison for other educational curricula structures. The graduate degree in design was organized vertically according to a conceptual

triangular structure which trilogy recognizes **author**, **technology & program** (the three sides and points of view of the design project). The main goal of this curriculum is to establish a balance between these tree points in order to create an accurate representative of a design programme. The programme believes that in the case of subtraction of one of these three point (poles) the polygon would lose its dimension and height, also reducing its surface to a dimensionality of a vector or an edge.

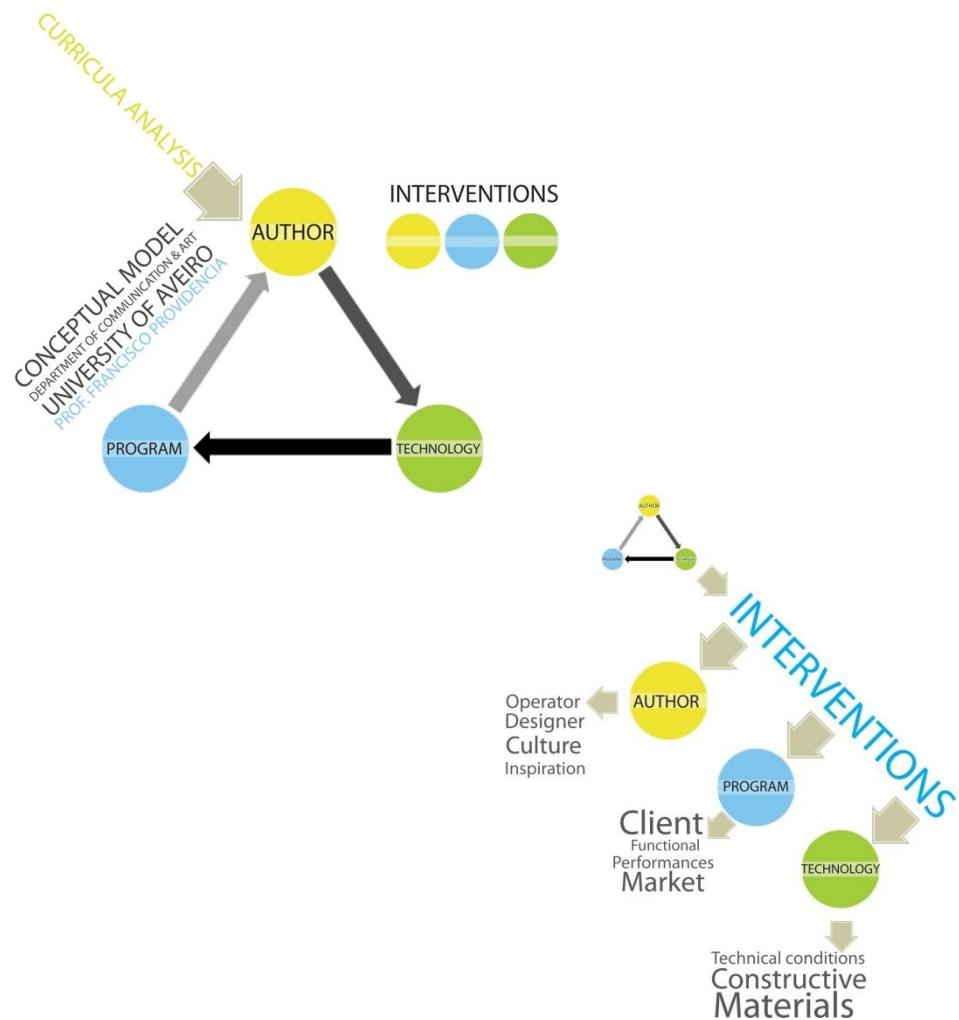


Figure 6.1: Design Interventions.

Source: Natasha C. Gonçalves.

In other words design practice is understood as the result of three kinds of interventions:

that which comes from the operator or designer, second that which comes from the technical conditions (technological development, materials & tools), and third that which comes from the client (direct or indirect) who understands a

programme of expectations and convergent performances with the interest of the market.

Examples of strict domain of the area **technology/program**, subtracting the experience of the author (operator) are frequently found in engineering where valuing optimization to a maximum, in order to standardize and universalize the solution. Where in design what is criticized is one-track (same) and not the innovative & original (different).

Examples of the edge **author/technology**, in which escaping from the functional pole of the programme is found in art where a piece of art that is functional (ex. political or religious functions) is seen as less of an esthetical operation than those that don't serve a functional purpose.

As a third alternative to design we confront the third edge **author/program** which lacks "doing" frequently in management. Because a good manager is he who can orchestrate a productive community without having to execute (do) any of the tasks. A manager always conducts strategically, always considering and obtaining the objectives of the program. The strategic abstraction of management, the obscure uselessness of art and the functional optimism of engineering finds in design an archaic expression of "doing" still humane, whose synthesis does not dispose of its artistic origin.

A designer is also a manager trying to resolve problems by anticipating, although never ignoring experience & technique always looking for new & alternative solutions. A designer is also in a manner of speaking an engineer; attentive to technical limits but never forgetting personal experience. In other words, Design with its artistic vocation is a result of a long tradition of "doing"; a doing that maintains duplicity of "me" and "other", oriented for a specific destination and contributing to the functionality of a humane and artificial world. So in order to not to create tension and rapture in design, it is important that design should contemplate all three dimensions mentioned, through culture of the individual, through all possible means of production available, and through the program of assigned performance.

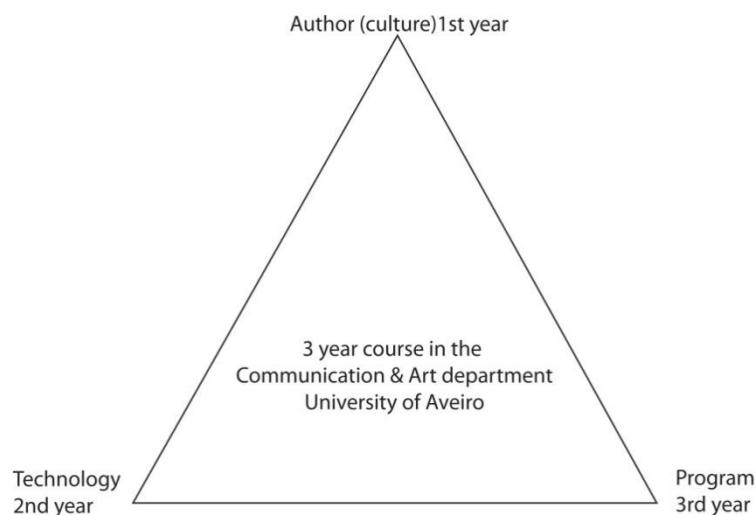


Figure 6.2: A Conceptual undergraduate curriculum model of the ‘Communication and Art department’ of the University of Aveiro. Francisco Providencia,(2003).
Source: Natasha Gonçalves.

Author: This comes from the operator or designer, culture, and individual inspiration. The project anticipation is focused on a cultural material base. The idea that all drawing has a meaning that could be symbolic, practical or other is found in the theoretical-practical exercises. This programme considers design as drawing of artefacts & devices; as a cultural interface.

Technology: This comes from the technical conditions & development, materials & tools, and constructive process. Students are confronted with multiple constructive systems that are available, being able to interpret them in a creative way. They experiment with new technical means in order to understand interactive devices and multimedia, with particular importance to contemporary tendencies for the visual simulation and dematerialization of reality.

Program: This comes from the client (direct or indirect), functionality and performances. Helps the student’s to understand the profile of a specific consumer, the creation of a design argument, answering the question about the targeted efforts of the design. Dealing with issues of social, functional, symbolic and aesthetic significance of objects and its relation with form; are the principal themes, exploring the link between representatives and represented, between brand and product or between distribution and industrial production as one, coexisting and global.

The graduate degree of design for the department of communication and art of the University of Aveiro is a three year/theme programme. The students start this course with the first year dedicated to the self-comprehension of design; (the means of how it understands what it achieves, what its activities are, how it negotiates the world, what it means to design), which will be involved in the problematic of the discipline, particularly concerning the project anticipation on the base of cultural material who's artificial instruments (artefacts & devices) are developed by drawing. The idea that all drawing has a meaning that could be symbolic, practical or other is found in the theoretical-practical exercises.

This programme considers design as drawing of artefacts & devices; as a cultural interface, bringing us to the principal pedagogical objective which is the student's comprehension of the double purpose that design suggests: the practical & symbolic dimensions of design accomplished through drawing which is born through desire. In other words drawing is a crucial fundament of design and this is why the university dedicates many curriculum hours to its practice. The first year for design education is known as "a general year".

Design is practiced through various exercises with strict and limited dead-lines; they are also open to the student's speculative proposals, and have a practical dimension where manual skill of constructing three dimensional objects, is alternated with graphical consideration through observation and collection of visual objects.

Two examples of exercises are: The creation of bridges using only spaghetti and glue, with this exercise the students learn how to expand their creativity even when technical and material resources are limited. The second is the design of an iconic alphabet with 24 characters, here the student learn that there are infinite possibilities to solve a problem through visual perception.

The main goal of both exercises is to evoke the student's interest for learning and satisfaction in producing new notions from already existing means. In short, the first year of the design educational programme is dedicated to familiarizing its student's with a structured methodology that includes global collection of information on a problem, analyses of the problem in its context, the proposition (suggestion) of a solution following the validation of the proposal and finally the communication of the result. This circle of analyses, proposition and communication could be a repetitive cycle along the realisation of the exercise through constructive criticism of validation and evaluation.

In the upcoming 1nd, 2nd and 3th year each year is dedicated to one of the three poles/themes of the conceptual triangular structure.

The first year where the student is focused on the fact that all realisation has an "author" and that the author affects the object. The author is understood as a coexistence of people and things, person plus his belongings, and as an anthropological agency. It is important that the student's realise an interior apprenticeship creating an inner fulfilment. This is promoted by drawing as an expressive practice and the means of a rhetorical exploration. Exercises like the analyses of designed products, evocation of figures that have style, or the reverse, where the student's choose a figure of style and then proceeds to make their own application of a visual representation of an entity (this or person).

The second year of the design programme spends a lot of its focus to the constructive process. The students should be confronted with multiple constructive systems that are available, being able to interpret them in a creative way. The brand and product should also answer to the same constructive metaphor and the choice of analyses of the productive means should be seen as a creative mean. The understanding of the system which ever it may be is fundamental for the result of the project, lack of experimentation and testing could harm the comprehension of technical limits and consequences validating the project. That's why the act of prototyping and the constitution of a well equipped library, material & technical supply are very important. In short the second year where the student will be experimenting with new technical means

in order to understand interactive devices and multimedia, with particular importance to contemporary tendencies for the visual simulation and dematerialization of reality is completely linked to the second pole/theme of the conceptual triangular structure.

In the third and last year the student is confronted with the domain of the programme (the third pole of the triangular structure). The programme is a generic designation attributed to the set of constraints semantic to the product. Frequently announced in marketing of assumptions of the destined users, conditions of use, culture, desires, potentialities, price and others; should be understood as important constraint and the design argument, answering the question about the targeted efforts of the design. Exercises of the 3rd year include public contests or inquiries lanced by regional corporations. These exercises are well defined by their markets and type of production.

A clear definition of a programme will oblige the student to understand the profile of a specific consumer. The main task of the educator (teacher) is to stimulate the creative potential of the student directing the project to solutions with a more creative prospective rather than stereotype always making sure that the project doesn't leave its feasible limits. Issues of social, functional, symbolic and aesthetic significance of objects and its relation with form; are the principal themes of the project in this phase exploring the link between representatives and represented, between brand and product or between distribution and industrial production and one, coexisting and global.

An historical example of design development through education systems, which are the common links between the unfolding of the design curriculum of Bauhaus and the conceptual model of the University of Aveiro?

Probably the most influential school of design of the 20th century was the school of Bauhaus (1919-1933). In 1902, Henry van de Velde funded in Weimar a seminar of applied arts that, under his orientation in 1906 was able to transform in to a school of applied arts. With Henry van de Velde interaction with the school of arts and under the direction of Walter Gropius the Staatliche Bauhaus Weimer was formed and came to be the starting point of a great design development.

Gropius chose abstract artists and cubism painters such as Wassily Kandisky, Paul Klee, Lyonel Feininger, Oskar Schlemmer, Johannes Itten, Georg Muche and Laszlo Moholy-Nagy as teachers for the school of Bauhaus. Due to the advancement of industrial production in the 19th century, and the diluted unity between design and production Gropius fundamental idea for Bauhaus was that arte and technique would become a new modern unity. The emblem phrase was: Technique does not require Art, but Art requires a lot of Technique. He believed that by uniting both Technique and Art there would be a social principal to reinforce art to the public; Based on this idea Gropius created the Preliminary course which was the heart of basic artistic and polytechnic education of Bauhaus. The Preliminary course allowed self- experimentation and self-investigation. According to Rainer Wick (1982) this was the first phase of Bauhaus. The preliminary course in the first phase of Bauhaus could be compared with the first intervention of the design curriculum of the University of Aveiro in the sense that both the preliminary course and the intervention of "Author" focus on the cultural aspect of creating and making things allowing individual inspiration through drawing, craft making and the process of investigating, proving and experimenting.

The second phase of Bauhaus is known as the phase of consolidation (1923-1928). During this period Bauhaus was becoming more and more an institution where industrial production and prototyping was being taught. This was a result of the reality of industrial production of that time and the social necessities of a wider public. Main goal of this phase was the development of products that met the necessities of its public and gave great emphases on functionality and accessibility. Again we find that this phase in the education system of Bauhaus could be linked to the intervention known as "Program" of the design curriculum model of the University of Aveiro where the Program intervention focuses on the needs, the functionality and the performances of the client or a certain market and how these factors should be taken in to consideration when practising design. Droste Magdalena (2006).

During the 1928-1933 we recognise the third and last phase of Bauhaus as the phase of disintegration. With the nomination of Hannes Mayer as director new disciplines and workshops were introduced in the school and art was permanently taken out of the curriculum. In 1930 Mien van der Rohe became director of Bauhaus school and in 1933 the school came to its end. The workshop based curriculum at this phase of the Bauhaus school and the introduction of technically based disciplines has common points with the intervention of "Technology" used in the conceptual structure that communicates design practice in the University of Aveiro due to the significance of technical development and material in both curriculums.

Table 6.1- The current complete design course for the 'Communication and Art department' of the University of Aveiro includes (1st year):

1st year > 1st semester	a.c.t tp pects
Design and Representation	DS 1 6 0 10
Theories and History of Design	DS 2 1 0 4
Contemporary Art Movements	EA 2 0 0 4
Design Project Basics	DS 1 4 2 12
1st year > 2nd semester	a.c.t tp pects
Project Design I	DS 2 4 2 12
Typography	DS 1 1 0 4
Aesthetics	EA 2 0 0 4
Portuguese Design History	EA 1 1 0 4
Design and Expression I	DS 0 0 120 6

Table 6.2- The current complete design course for the 'Communication and Art department' of the University of Aveiro includes (2nd year) :

2nd year > 1st semester	a.c.t tp pects
Design and Expression II	CTC 1 6 0 10
Materials and Technology I	DS 1 2 0 4
Communication Theories	CTC 2 2 0 4
Design Project II	DS 1 2 2 12
2nd year > 2nd semester	a.c.t tp pects
Design Project III	DS 1 2 2 12
Materials and Technology II	DS 1 2 0 4
Design Management	CEM 1 1 0 4
Design and Representation II	DS 0 6 0 6
Interaction Design	DS 1 1 0 4

Table 6.3- The current complete design course for the 'Communication and Art department' of the University of Aveiro includes (3rd year) :

3rd year > 1st semester	a.c.t tp pects
Strategic Design	DS 1 2 0 4
Design and Knowledge I	DS 0 3 0 4
Design Project IV	DS 1 2 2 14
Reprographics	DS 1 1 0 4
Semiotics of Artefacts	DS 1 1 0 4
3rd year > 2nd semester	a.c.t tp pects
Design and Knowledge II	DS 0 3 0 4
Project Management and Budgeting	DS 1 1 0 4
Project Design in Companies	DS 1 2 2 16
Strategic Design Project	DS 1 2 1 6

The curriculum of this course dedicates a large amount of time and effort on the focus of drawing as a means of cultivating design skills. According to Professor Francisco Providencia (2009) - Design, has its origin from the Latin *desenho* which in Italian signifies both design and drawing. There is therefore a design unequivocal, a project-dimension on the future (design) and an artistic dimension of graphic record (drawing), the idea of representation and the body that conceived (desire); Drawing follows desire which gives it meaning.

6.2 Practical issues in planning a design curriculum based on the educational system of Carnegie Mellon University

In order to understand the fundamentals needed to create an education system for a design undergraduate program, we turn to the four fundamental issues that have been employed at the Carnegie Mellon University (Pittsburgh Pennsylvania) to plan both undergraduate and graduate programs.

The four fundamental issues:

- a. Teachers and students. (They are the agency and the agents of learning.)
- b. The form (the structure and the content of the program we seek to create and the experience wished to offer to prospective students).
- c. The resources. (To find out whether the plans are financially and intellectually feasible.)

- d. Determine the goal. (This will reveal our vision and provide us with objectives and criteria of evaluation).

There are factors that may influence these issues and other questions such as (employment prospects, competitive positioning, management and administration plans) that may fall in one of the four categories. These factors may arise from practical and intellectual differences among national context. However these may be some common elements:

I. PEOPLE

Students:

- Rare level of genius students, that may gain more benefits from general education of the liberal arts rather than an education in design specifically.
- Common modest talent students, for who design education is most important. Some of these students will learn design by imitating the work of experienced designers, following every step and listening to every word so they may move from novice to socialized professionals.
- Other students more frequent are the students that learn to practice design by learning the principles of the discipline and the application of those principles in concrete work. (This is a pattern of apprenticeship and the pattern of trade schools of design that are common around the world).

Teachers and colleges:

- Teachers who have made a life's work of seeking to understand the principles of design and who wish to share their knowledge, whether great or small, with a new generation. Possible features are love for knowledge and teaching, sometimes practice design when not teaching.
- Practicing designers who may have a similar love of learning and teaching, this is why they join the faculty as adjunct professionals. Features are placing practical knowledge within a curriculum and teaching by doing.

II. FORM AND STRUCTURE

In planning the structure and content of an undergraduate design education, it is important to understand the differences among undergraduate, master's, and recently doctoral education.

Undergraduate: Should provide a sound education in the liberal arts and in the fundamental knowledge and skills of a discipline that prepare a student for a productive life in our culture. A student is properly educated when he or she understands a body of facts and is able to reason, make intelligent connections, and interpret facts in order to assess what is significant and valuable. The emphasis falls on reasoned facts, based on general education as well as specialized experience in the ideas and methods and recognised principles of a discipline. Applied to design, it should prepare a student for entry-level employment in the profession or for advanced study in a graduate programme.

Master's education: A master's student must go on to demonstrate mastery of the ability to make reasoned connections and to compare alternative ideas and methods within a chosen area of competence. In design it means, the student should demonstrate mastery of the practice of design, as it is applied in an area of personal choice, leading to a completed design project. This project should be justified and backed-up with the help of papers, texts, authors, existing work of other professionals.

Doctorial education: The student should demonstrate the ability to conduct original inquiry on a substantive problem for which there are no existing answers that are adequate for the standards of human understanding.

III. FORM AND CONTENT

Content is probably the clearest points of difference among existing and planned educational programs. Based on experience of other fields of inquiry, the differences will be both thematic and philosophic.

Thematic differences: are based on themes that are explored because of the interest and experience of faculty members. They are also based on

disciplinary strengths of the university within which the design program is located. Some programs may focus on history, criticism, and theory, pursuing broad philosophical inquiry or developing an area of special focus, such as design history. Others may focus on themes such as environmental planning, information design, or interaction design. Still others may focus on design management, strategic design planning, integrated product development, or design for specific segments of rehabilitation, gerontology, or any host of other thematic areas. The diversity of themes is necessary and important in the exploration of design in research, but thematic differences present a serious problem for design. The danger is that we may see a new genre of design, specialized so narrowly in subject matter that the students and the programs stop interacting and talking to each other. So how can we maintain the centralistic orientation of design and combine that with specializations? In order to answer this question common ground should be found in our field in order to help avoid the design educational programs sink into excessive specialization, thus leading us to the philosophic differences.

Philosophic differences: The common subject matter and simple questions give identity to design as a field of inquiry. In the synthesis of what is useful, usable, and desirable in goods that are designed and made to support human beings in the accomplishment of their individual and collective goals. The terms useful, usable, and desirable are important because they are a sign of the revolution of design and the deep shift of perspective on the nature of products. Design has shifted from an external view, oriented toward an internal view, focused on the materials, and manners of production of products, toward an internal view, focused on the human experience of products. Without abandoning the external view, the study of form, function, materials and manner of production continue to provide rich insight into the products of our culture. But we have come to recognize that form is not something that we must view only from outside, form can be understood from the internal perspective of the person who uses a product- who experiences it as useful, usable and desirable.

IV. GOAL AND PURPOSE

As a goal design undergraduate education does not only seeks knowledge as an end in itself, but also understands that knowledge may be practical, and design knowledge may lead to improved design practice and improved design education. This will prepare a student for entry-level employment in a profession or for advanced study in graduate program.

6.3 Brief chapter conclusion - Summary

This chapter presents the case study of design course and curriculum of the University of Aveiro in order to exam the principles that should be taken in to consideration when developing a design curriculum; Principles such as approach of transferring knowledge, links to research, and the learning environment. The course at the University of Aveiro is formed by four phases in which the first year is focused on the individual development through drawing, through analyses of artefacts as rhetorical containers and identities, theory and culture. The second year explores and experiments with constructive syntax as a creative device using materials, tools and technical development. The third and last year considers and communicates the semantics of objects in the context of its market and its use helping students to understand the profile of a specific consumer and how to create a design argument. This close look in to the design course and curriculum of this case helps create awareness of the importance of all specific choices made when creating design curricula from the interventions used to transfer specific aspects of design knowledge to the structure & content of the programme, the financial & intellectual recourses.

7 Chapter - Curriculum analyses based on responses of academic representatives

In order to achieve a global view of the educational institutions including universities, colleges, schools, and academies that have contributed effectively throughout the history of education of design, it is important to understand the basics of an undergraduate Design course curriculum and its contribution to design education. This will be done through a more detailed look in to a few of these institutions forming a quantitative and qualitative study. Quantitative study is the study that will allow us to gather all collective information of the institute; such as location, courses, credits, funding, awards and other. A qualitative study will allow us to measure the weight and emphasis given to the curriculum as well as help us distinguish the amount of weight distributed amongst the three points that form the curriculum structure based on the undergraduate curriculum of the Communication and Art department of the University of Aveiro.

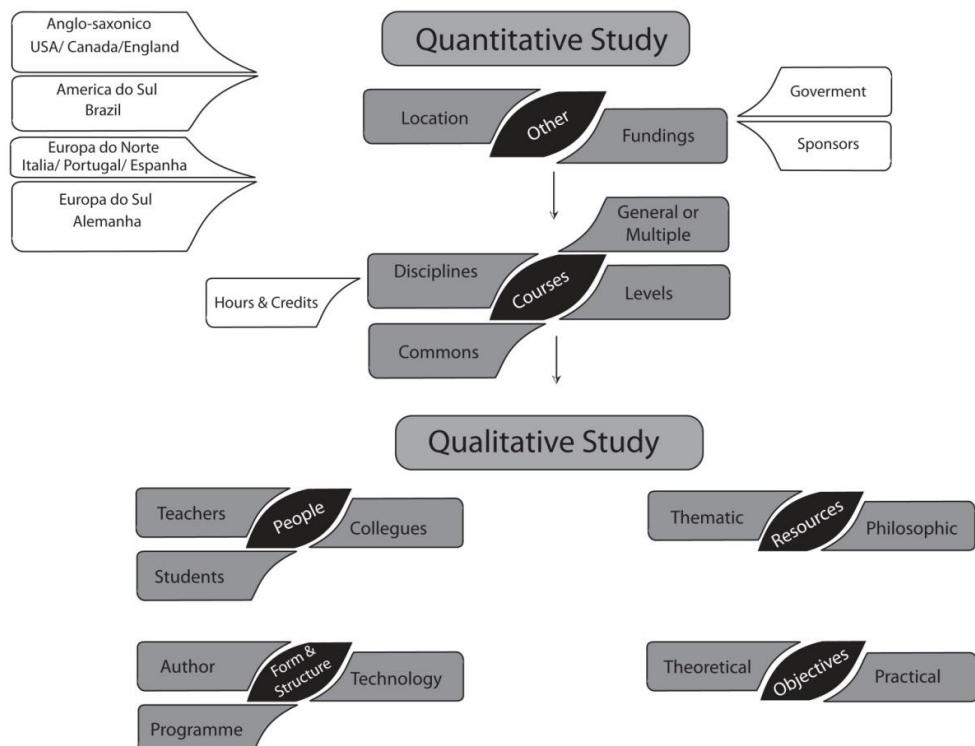


Figure 7.1: Quantitative and qualitative study.
Source: Natasha C. Gonçalves.

7.1 Survey-Questionnaire

The survey was distributed through one-on-one e-mail to respondents. A variety of question formats including matching, ranking, and choice were used to gain a more complete perspective. The survey appealed to a varied population of design professionals including design theorists and professors. The questionnaire was constructed completely under the support of the study case (University of Aveiro, curriculum model of the ‘Communication and Art department’ by Professor Francisco Providencia). A series of questions were asked in order to determine with what representation logic each faculty in question would communicate their current design curriculum based on the triangular model used in our study case. How is the context of the trilogy used to communicate the three main Interventions of our course identified through the respondent’s communicative logic. The objective of this terminological analysis is the construction of a Semantic Constellation. Another goal of this questionnaire was to diagnose if there exists a hierarchy between the interventions of each faculty in question, and how this hierarchy is expressed. In other words; Specific issues pertaining to design education including the representation logic, terminology, priority and improvement in design education are all the goals of this analysis.

This survey was distributed in the beginning of the month of April 2010.

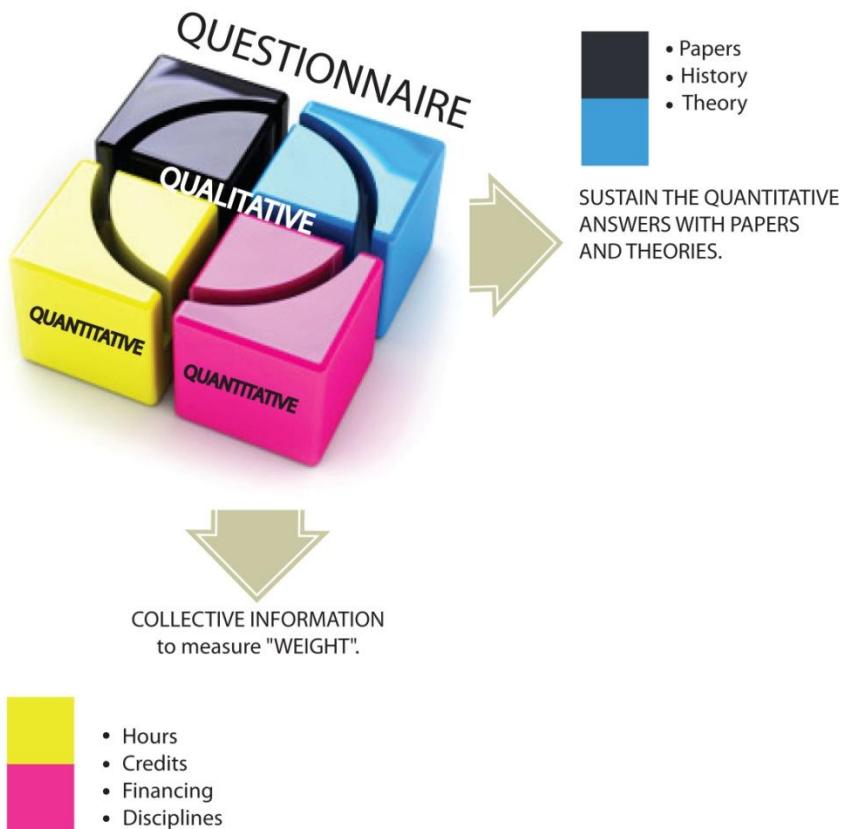


Figure 7.2: Quantitative and qualitative study.2.
Source: Natasha C. Gonçalves.

7.1.1 Participant Selection

An in-depth survey was distributed to a broad spectrum of design professionals including professors and theorists whom have been selected for their relevant relationship with the design curricula of excellent faculties which are distinguished for their successful design courses.

Table 7.1- Listing of Participants:

	Country / Institutions	Professors
ITALY PORTUGAL CANADA USABRAZIL	Caldas da Rainha	Prof. Jaime Sousa
	Lisbon IADE	Prof. Eduardo Corte Real
	Lisbon UTL	Prof. Fernando Moreira da Silva
	Belas Artes de Lisboa	Prof. Ana Tudishum
	Belas Artes do Porto	Prof. Heitor Alvelos
	Politecnico di Milano	Prof. Silvia Pizzocaro, Francisco Trabucco, & Prof. Flaviano Celaschi
	Politecnico Di-Torino	Elena Formia
	Belo Horizonte UENG	Prof. Dijon de Moraes or Prof. Lia Krucken
	Rio de Janeiro UFRJ	Prof. Marcus Dohmann
	São Paulo USP	Prof. Maria Cecilia Loschiavo dos Santos
U.K CYPRUS	Porto Alegre UNISINOS	Prof. Fabio Parode
	Minas Gerais ESAD	Prof. Margarida
	Massachusetts Institute of Technology	Prof. George Stiny
	University of Illinois Chicago	Prof. Victor Margolin
	Monterreal Univ. Alberta	Prof. Jorge Frascara
CANADA	The Open University	Prof. Nigel Cross
	Sheffield Hallam University	Prof. Chris Rust
CYPRUS	Frederic University Cyprus	Prof. Costas Mantzelos Prof. Artemis Eleftheriadou

Polytechnic of Milan (Italy, Milan) - This Academy dedicates one of its many faculties to Design Education with its current programs including: communication design (3 year course), Fashion design (1 year course), furniture design (3 year course), industrial design (3 year course), interior design (3 year course) and product design (3 year course). Polytechnic Di-Torino (Italy Torino) - This Academy dedicates in its courses of its Architecture School three Design courses which includes: Architecture and Design, graphic and virtual design and Industrial design. All of the above courses have the duration of three years. Faculty of Belo Horizonte UENG (Brazil) - dedicates two courses to the education of design that duration lasts for eight semesters, such courses are: Graphic Design course and Product Design.

Faculty of Rio de Janeiro UFRJ (Brazil) provides a Industrial Design course that lasts eight semesters. Faculty São Paulo USP (Brazil) – Currently offers a design course that includes subjects such as: Usability and Performance, Design for the Environment and Sustainability, Project Management in Design, and Materials and Production Processes IV. Porto Alegre UNISINOS (Brazil) – Provides an Undergraduate Program in Design. The program holds a 3-year fulltime. Minas Gerais ESAD (Brazil) - Provides courses dedicated to design such as: Computation for Design and Optimization and Media Arts and Sciences.

Members of the PHD-Design studies and related research in design have also been contacted suach as: Professor and Dean Ken Friedman - Swinburne University of Technology Melbourne Australia; Dr. Terence Love - School of Design and Art; Professor Victor Margolin -Department of Art History, University of Illinois at Chicago; Dr. Ian Walsh BA (Hons), PhD, MCSD, FRSA Head of School-Pennaeth YsgolDr; Joyce Yee School of Design - Northumbria University; Dr. Lily Diaz Professor -Department of Media- Aalto University, School of Art & Design Finland.

7.1.2 Limits of study

It was a lucid decision to keep the survey and study in the occidental world for specific reasons which include: Keeping this study in a manageable space which allows an amount of control and reliability, keeping a relatable relationship between participant and source of study as well as to the study case. Although this study is well aware of the great design development that started in the 80's in many Asian countries including Hong Kong, Chorea, Singapore or Taiwan. Particularly the big companies in Japan, Chorea and Taiwan dedicated themselves massively to the strategic aspect of design. According to prognoses, half way through the 21st century, two thirds of the world wide population will be living in Asia. Three of the main counties are: India (because of great population growth), Japan (because of its massively developed industry), and China (as the strongest market). Therefore design in these counties can not only be seen in a strategic form because of the great consideration given to the economic area that functions and develops entirely autonomous to the European and American ways.

7.1.3 Results of Survey

Although the survey was sent and distributed to 22 recipients there was a small set back of only 32% of respondents which is a strong reason for this information not to be 100% conclusive. Never the less a number of interesting points came out of the survey and within the respondents we have view points from Italy, Chicago, Cyprus, Brazil and the U.K. Out of the 32 % that responded approximately half of respondents found the triangular representation to be a logic representation for the communication of Design curricula suggesting that it is well communicative as well as interesting. These respondents all expressed that it would be a great challenge if not impossible to maintain total equilibrium among the three points of the triangle and that probably the isosceles triangle is not the best way to represent design curricula.

The other half found this representation logic difficult to relate to, as well as not being able to translate the teaching experience into a triangular diagram. Although this information is not fully conclusive, it does seem to suggest that almost 50% of faculty have a preference toward a more fluid logic of representation rather than a solid geometrical representation. An interesting suggestion among these respondents was that of a Matrix as a representation logic where a rectangular array of elements coexists and may be added, subtracted and multiplied; allowing a more complex and fluid interaction of the elements which contribute to the whole educational experience.

At the attempt to Building a Semantic Constellation for the terms **AUTHOR**, **TECHNOLOGY**, and **PROGRAM** various analogies where made.

AUTHOR	=	One that is the first cause of something existing
		The promoter, the producer, the maker
		Creator or originator of something
		The subject of a design intervention, action or contribution.

He who might create, or invent or practise an action (design) but always this action (design) has to produce something.

He who produces something original, something never produced before or at least not for the same effect.

Imagination with responsibility, self confidence and enjoyment.

Inspiring, Aspiring and Communicative

TECHNOLOGY

= The tools, the processes and materials involved in the creation of a design.

The study of applications & combinations of resources to solve a problem.

Connection between science and the execution of a design project.

How to make things (either material or immaterial).

Knowing the materials, the tools and processes at ones disposition.

PROGRAM

= Organizing & establishing an order with which we must work.

The parts in a process that will lead us to a final design.

Sometimes (but not always) similar to methodology.

The conditions and commands connected to summaries all design and work intentions.

Logical Structure that can direct learning and teaching from instruction to self-negotiated projects.

All respondents agree that the above elements should be integrated in design curricula one way or the other as they have been defined by each respondent; based on the opinion that without authorship, technology and a well elaborated program learning can't be applied and knowledge can't be acquired; although both are needed to turn us capable of improving our productivity.

As for the terminology used to express design curricula, the majority of respondents included the term **Problem solving**.

Problem solving	=	Research, experimentation and development.
		Production and utilization of technical solutions.
		An updated idea of the designer profile.
		Creative and critical thinking about ways to increase the quality of life.

A large amount of emphasis was given to the term **Design Thinking** and it seems to be one of the terms which is positioned high when it comes to hierarchy.

Design Thinking	=	The cognitive skills that designers use.
		Constructive discontent in the way designers think.
		Understand what it is that people do when they are designing.
		The integrated side for a contemporary designer.

Other terms chosen by the respondents were **Design** as the reflective side for the designer education; **Human-centre** as the required approach to lead current curricular and **Complexity** as the designer environment.

As for hierarchy of elements in design curricula it has been described as mainly conceptual and devoted to build a sort of in progress learning scale. Introducing any hierarchy in a curriculum would result in creating the first step which will create ground for the next step and not particularly give more emphasis to the first step rather than the second or third.

After the interpretation of all terms it is important to find the relation between and among each one, this would be the objective to the creation of a Semantic Constellation below:

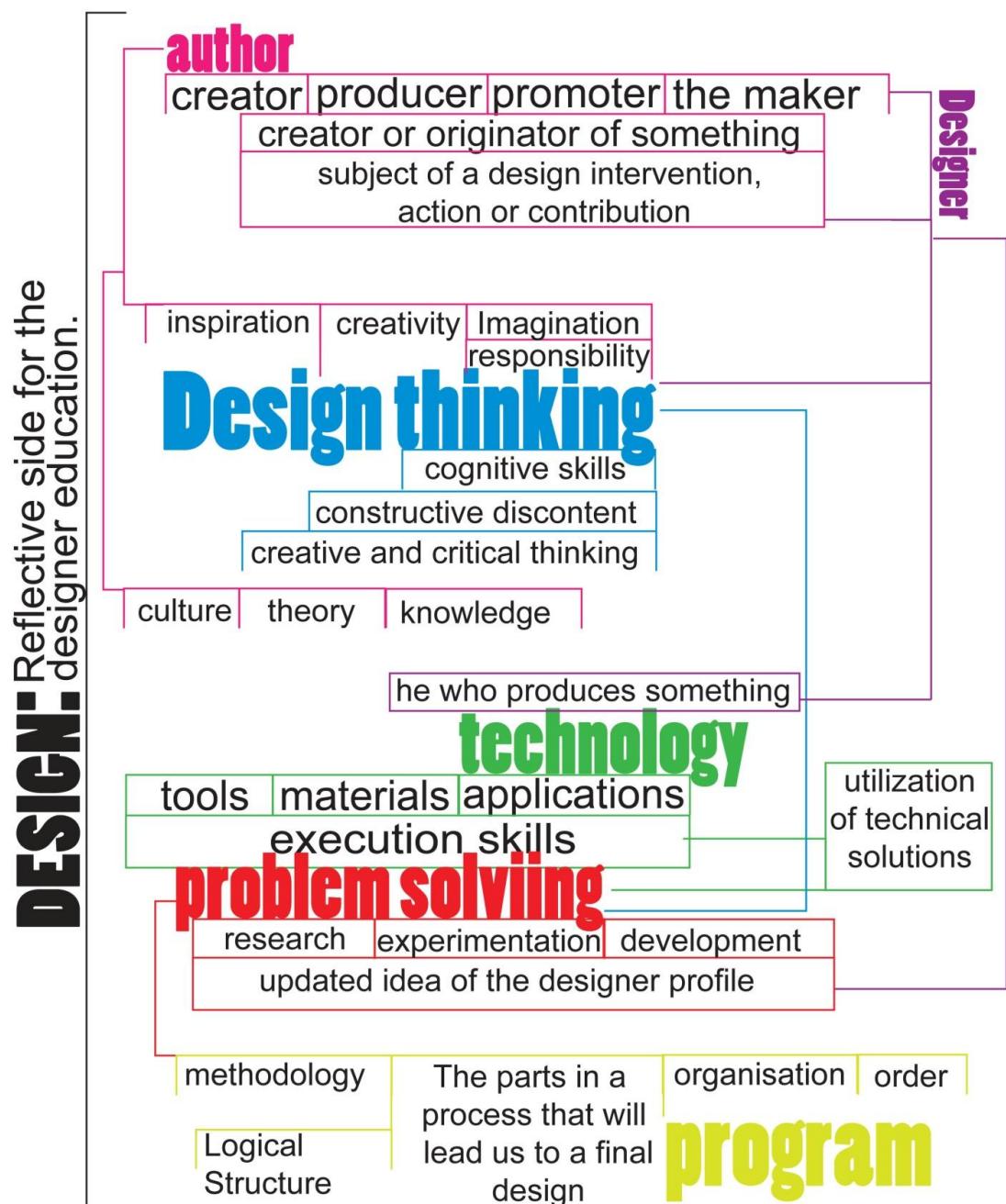


Figure 7.3: Semantic Constellation.
Source: Natasha C. Gonçalves.

7.1.4 Conclusions of Survey

This survey may be a contribution to the idea that there is not just one right way of transferring design knowledge as there is no one right way to design itself. Although this does not mean that there is no error or mistakes as well as space for improvement. Therefore from all the different constructed curricula that have been examined, the different interpretations of terms and, the different positioning of elements; it has been concluded that sometimes it is best to see things as a puzzle where each piece does not just have one right position. This way it is possible to play around with these pieces and construct a different path of logic for the same purpose using the same elements or even being able to add or deduct to and from it.

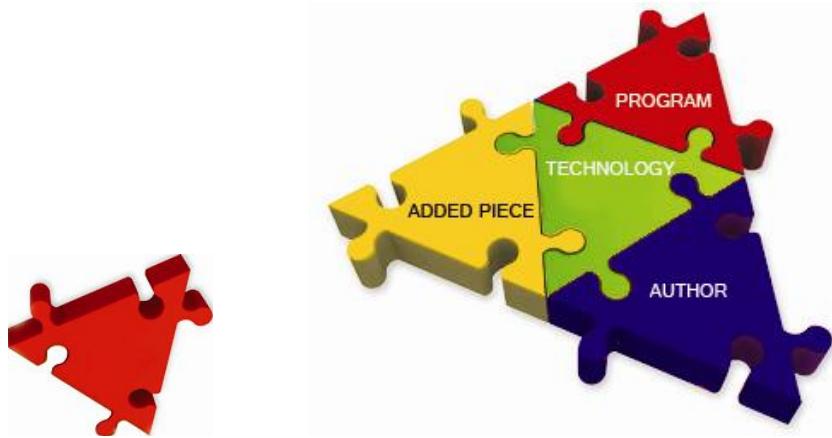


Figure 7.4: Example Puzzle.

Source: Natasha C. Gonçalves.

Design as a discipline has been very fluid in comparison to other more scientific disciplines and therefore it is natural that the design curricula will also have this more fluid character. Elements that construct the curricula many times work side by side and no longer work in separate compartments making the learning process more inductive. A good example is the use of both Theory and Practice in the design learning process, where theory informs practice and practice is grounded in theory.

From the curricula analysis it could be said that design curricula may be communicated with a large variety of elements, terms, interventions; it can be presented visually with shapes, models or other ideas. The conclusion extracted from this analysis is that no matter what term or element used to express a certain aspect

or characteristic of design education there is a strong relation (direct at times and indirect at others) that connect all curricula to the same purpose.

Design is transforming in to a strong discipline as its own right and independent of others. Design is not Art and design is not science but design does include art and does include science and this is what makes design unique and worthy of being an intellectual discipline.

In a verity of faculty which each has their own background, history and goals; some having a more traditional University setting than others. These differences affect the way the course or curriculum is approached. For example at the Open University – UK all undergraduate students work from home and do not coexist on campus, course material is prepared and available to students on-line.

According to the response of Prof. Nigel Cross; The Open University does not offer a full design degree; the degree can be a combination of a number of credits that the students take from all kinds of subject areas including some design. This University does not try to produce professional designers, its goal is to produce educated people who have something about design in their education in the same way that it is valuable to have knowledge of literature and science.

On the other hand the school of Design in Milano is the result of revisions and integrations of the traditional academic framework. Silvia Pizzocaro explains with her responses that; Historically, the Italian university has been organized on the basis of a vertical division of knowledge with the educational pathway framed as a deductive process. Until very recently, in most disciplines academic education was organized in a linear and sequential manner, with theory and related knowledge representing the starting phases of the learning process and the technical and practical activities - the practice – deferred at the end of this process or, in some cases, to the very final phases of the curricula. This system was revised when the recent restructuring of the academic system took place. This academy produces industrial designers who have theoretical, scientific and professional knowledge that provides a complex of factors aimed at communicating the produced product while giving it a sense such as the aspects of graphic design and the design of brands, web sites, etc. As a conclusion, every faculty has space for more research and development to improve their design courses.

8 Chapter- Outcomes

8.1 Conclusion of study

Academic choices, methods and tactics affect the educational experience of both the student and the teacher. Creating a well structured curriculum is beneficial for the Design student's progress and intellectual growth. Knowing the range of different ways students are affected by the learning experiences, allows a better understanding of the kinds of learning environment that should be encouraged and that will eventually result in the creation more competent designers.

In order to understand what affects the contemporary student and therefore integrate various of those aspects in to the educational experience; the exploration of the relationship students have with the world around them and from the sources from where they find inspiration such as literature, art, cinema, architecture and other will allow the creation of educational systems and educational curricula that will rise student levels of performance. How well students engage with these experiences affects their learning outcomes. All students have the ability to design to some extent, how well they perform certain skills that define design ability such as creating unexpected solutions, tolerate uncertainty & work with incomplete information, applying imagination & constructive forethought to practical problems, as well as the use of drawing and other modelling media as means of problem solving; will also define to what degree and level of professionalism each student can reach.

The design curriculum may also serve as a guide within a design discipline that steps out of traditional scientific orientation and crosses disciplinary boundaries; therefore leaning toward a "neoteric" educational enterprise. When developing a Design educational curricula it is crucial that a large amount of attention be given to the particularities, differences and challenges that may arise from course to course and from developments such as economical, social or technological. These factors create the necessity for design education to rise to these challenges and new responsibilities and opportunities. The traditional studio culture has had some difficulties in holding its ground against the demands of current practice due to remote interaction via technology. Therefore creating a important role for technology and a virtual based

studio that may solve communication problems among designers and design students all over the world as long as used with caution and not misunderstanding the role of this media to overlap the role of the physical presence of the educator and the coexistence of students.

Practice as well as theory is an important element for design and design education. The one without the other leaves the design project lacking. In reference to the history of design being integrated in to the design curricula, a stronger engagement by historians would contribute to the wider discourse on design and help shape design reflection as an activity grounded in historical experience as well as current technique.

The incorporation of design history within design curricula could invite dialogue with other researchers besides historians without detracting the attention from design history's own identity.

Learning about Design Research, the role & objectives that the Design Research Society has developed allows us to believe that the development of a productive design studies community would be a fundamental support to faculties design courses and curricula. Such a community would benefit from operating outside the class room as well as encourage communication across all design disciplines; supporting the improvement of design performance and contributing to a coherent body of scholarship and knowledge in design. It is important for designers to better structure their design research in order to ensure that it adapts to the changing demands of our time and empower users in the design of their products, systems & services.

8.2 Clues to future developments

It is important that design research becomes part of design curricula; Problem solving methodologies are not always adequate or concerned with how design is done in addition to doing it. This is a field that has space for growth and great perspectives without contradicting creative, artistic or intuitive aspect of design. The origin of design research was to build and maintain design as an intellectual discipline as its own right.

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APPENDIXE

Appendix A: Survey-Questionnaire

Survey /Questionnaire

Introduction:

This questionnaire is intended to contribute to a curricular analysis which main attempt is to understand the curriculum functions of Design education at an undergraduate level. All responses will be gathered and analysed in contribution to this study.

Context

Framed in a dissertation thesis which topic is '**Curricula analyses toward the contribution to the understanding of the processes in design education; Focused on an undergraduate level**' and with the support of a strong 'body' that will serve as a point of approach, comparison, discussion and observation, among other faculties, universities and institutions grounded in intellectual and cultural biases that favour theory and practice; As well as providing a case study of the establishment of a design curriculum. In this case, the 'body' employed is the Design curriculum of the Communication and Art department of the university of Aveiro, structured by Prf. Francisco Providencia. This study aims to research the various and divers approaches of several faculties of the occidental world, and analyse the curriculum structure of their design courses. Through this analysis it is estimated to create a panoramic view of the differences and commons of the various approaches, and how each curriculum communicates its point of execution.

Please fill in your personal information.

1. Profile of the interviewee

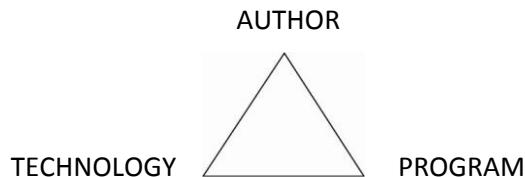
Name:

Position:

Faculty/Department:

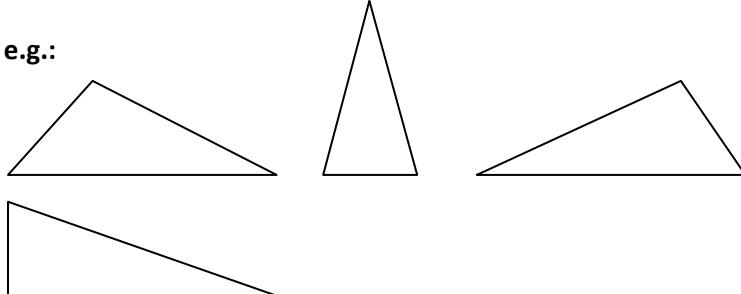
2. Conceptual Model

At the University of Aveiro a conceptual triangular diagram is used to communicate the current design curriculum.



- a) Would you use the same representation logic to communicate your Design curriculum? If not please specify?
- Considering the curriculum experience of your faculty, would it be possible to produce a similar dialog between the variables 'Author', 'Technology' and 'Program'.
 - If the weight between the above variables were not equal, which could be the mental figure produced from their relation? (Visual of your curriculum experience).

e.g.:



3. Introductive-Terminology

In our context we use the below words to communicate the 3 main interventions that together structure our curriculum.

TERMS	DEFINITIONS
AUTHOR	Individual inspiration. Operator or Designer. Culture, Theory.
TECHNOLOGY	Technical development, Materials, Practice
PROGRAM	Relation between client & designer, Coexistence with outside partners

a) Building a Semantic Constellation

I. How would you define each term?

TERMS	DEFINITIONS
AUTHOR	_____
TECHNOLOGY	_____
PROGRAM	_____

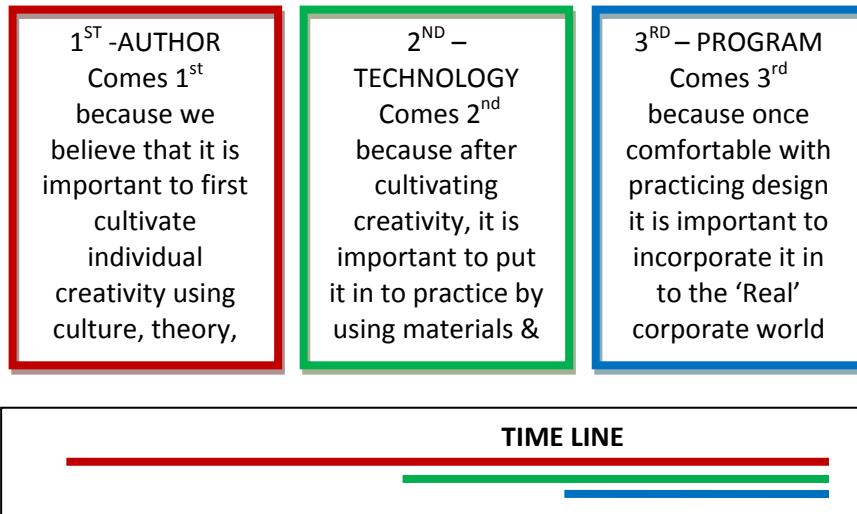
II. Would you use the above terms (as you have just defined) to best communicate your curriculum? If not please specify your terms and their definition as you understand them.

TERMS	DEFINITIONS
_____	_____
_____	_____
_____	_____

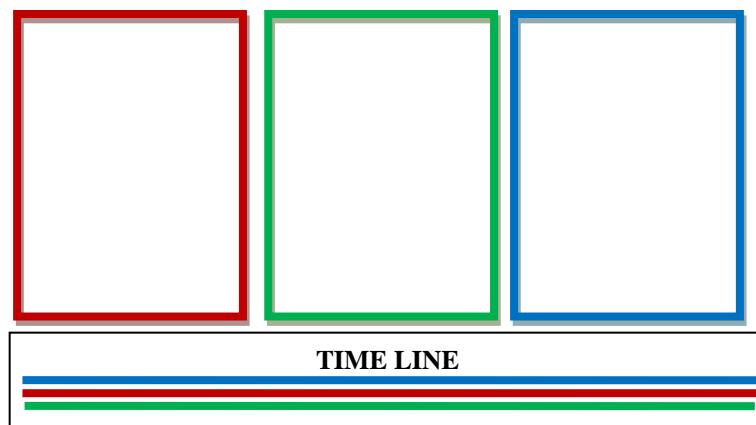
Although all the interventions are important to create a design curriculum, we search to find out if there is a hierarchy between them and how this hierarchy is expressed.

In our design curriculum we were able to place our interventions in executive order:

EXECUTIVE ORDER



- a) Do you agree with this logic of creating a hierarchy, could you incorporate your curriculum in to the same logic? (Feel free to add more boxes and alter length of lines in order to get a more accurate result for your curriculum as well as specify the course duration).



- b) Do you have a different logic in order to communicate the hierarchy of the interventions that structure your curriculum, please specify?
- c) Do you believe that by creating a hierarchy for the interventions in a curriculum, simultaneously a priority of design skills is created?
- d) Is there a specific intervention in your faculty's current curriculum that you believe needs improvement?

Thank you very much for your co-operation.

Please return as soon as possible and before the 10th of May of 2010.

To: Natasha- Elena Christodoulou Gonçalves. / Student of the University of Aveiro / Communication & Art department / Masters Program of 2008-2010.

Email: natashaelenagoncalves@gmail.com

Orientation and Guidance by: Prof. Rui Roda & Prof. Francisco Providencia.

Page five of survey- questionnaire.

Appendix B: Survey- List of respondents

Name: Silvia Pizzocaro

Position: Associate Professor in Industrial Design

Faculty/Department: Faculty of Design, INDACO Department of industrial design,

arts, fashion and communication

Institution: POLITECNICO DI MILANO

Name: Nigel Cross

Position: Emeritus Professor of Design Studies

Faculty/Department: Open University in Milton Keynes UK

Institution: THE OPEN UNIVERSITY

Name: Victor Margolin

Position: Professor of Art and Design History

Faculty/Department: Architecture and Art department

Institution: University of Illinois at Chicago

Name: Costas Mantzalos

Position: Professor of Information Design

Faculty/Department: Applied Arts Department

Institution: Frederick University Cyprus school of Architecture,

Fine and Applied Arts

Name: Artemis Eleftheriadou

Position: Associate Professor of Graphic Design /

Contemporary Art

Faculty/Department: Applied Arts Department

Institution: Frederick University Cyprus school of Architecture,

Fine and Applied Arts

Name: Chris Rust

Position: Professor of Design /Development of practice- led research methods

Faculty/Department: Arts and Design Department

Institution: Sheffield Hallam University- South Yorkshire

England

Name: Dijon Moraes

Position: Vice-Rector and Professor Theory and Design

Faculty/Department: School of Design

Institution: Universidade de Estado de Minas Gerais -UEMG

Appendix C: Survey- Questionnaire-Answers

SILVIA PIZZOCARO - Survey /Questionnaire

Introduction:

This questionnaire is intended to contribute to a curricular analysis which main attempt is to understand the curriculum functions of Design education at an undergraduate level. All responses will be gathered and analysed in contribution to this study.

Context

Framed in a dissertation thesis which topic is '**Curricula analyses toward the contribution to the understanding of the processes in design education; Focused on an undergraduate level**' and with the support of a strong 'body' that will serve as a point of approach, comparison, discussion and observation, among other faculties, universities and institutions grounded in intellectual and cultural biases that favour theory and practice; As well as providing a case study of the establishment of a design curriculum. In this case, the 'body' employed is the Design curriculum of the Communication and Art department of the university of Aveiro, structured by Prf. Francisco Providencia. This study aims to research the various and divers approaches of several faculties of the occidental world, and analyse the curriculum structure of their design courses. Through this analysis it is estimated to create a panoramic view of the differences and commons of the various approaches, and how each curriculum communicates its point of execution.

Please fill in your personal information.

1. Profile of the interviewee

Name: **Silvia Pizzocaro**

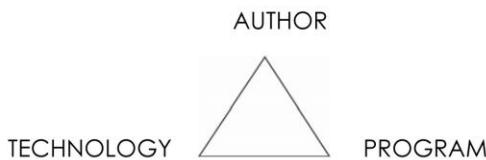
Position: Associate Professor in Industrial Design

Faculty/Department: Faculty of Design, INDACO Department of industrial design, arts, fashion and communication

Institution: POLITECNICO DI MILANO

2. Conceptual Model

At the University of Aveiro a conceptual triangular diagram is used to communicate the current design curriculum.



- a) **Would you use the same representation logic to communicate your Design curriculum? If not please specify?**

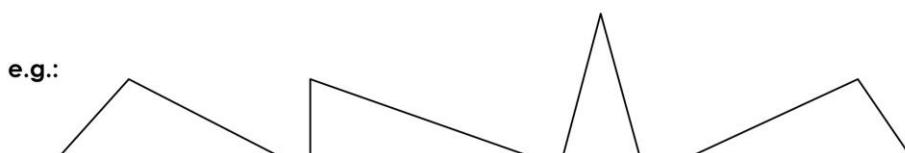
No, I don't think so. As a first idea I would rather use a matrix.

- **Considering the curriculum experience of your faculty, would it be possible to produce a similar dialog between the variables 'Author', 'Technology' and 'Program'.**

No, I don't think so. Multiple, complex and fluid interactions could better describe the experience I have been exposed within the local curricula.

- **If the weight between the above variables were not equal, which could be the mental figure produced from their relation? (Visual of your curriculum experience).**

It's really hard for me to translate the teaching experience into a triangular diagram, I simply can not figure it out.



3. Introductive-Terminology

In our context we use the below words to communicate the 3 main interventions that together structure our curriculum.

TERMS	DEFINITIONS
AUTHOR	Individual inspiration, Operator or Designer, Culture,
TECHNOLOGY	Relation between client & designer, Coexistence with
PROGRAM	Technical development, Materials, Practice

a) Building a Semantic Constellation

I. How would you define each term?

TERMS	DEFINITIONS
AUTHOR	The subject of a design intervention, action or contribution.
TECHNOLOGY	How to make things (either material or immaterial) and
PROGRAM	Sometimes (but not always) similar to methodology

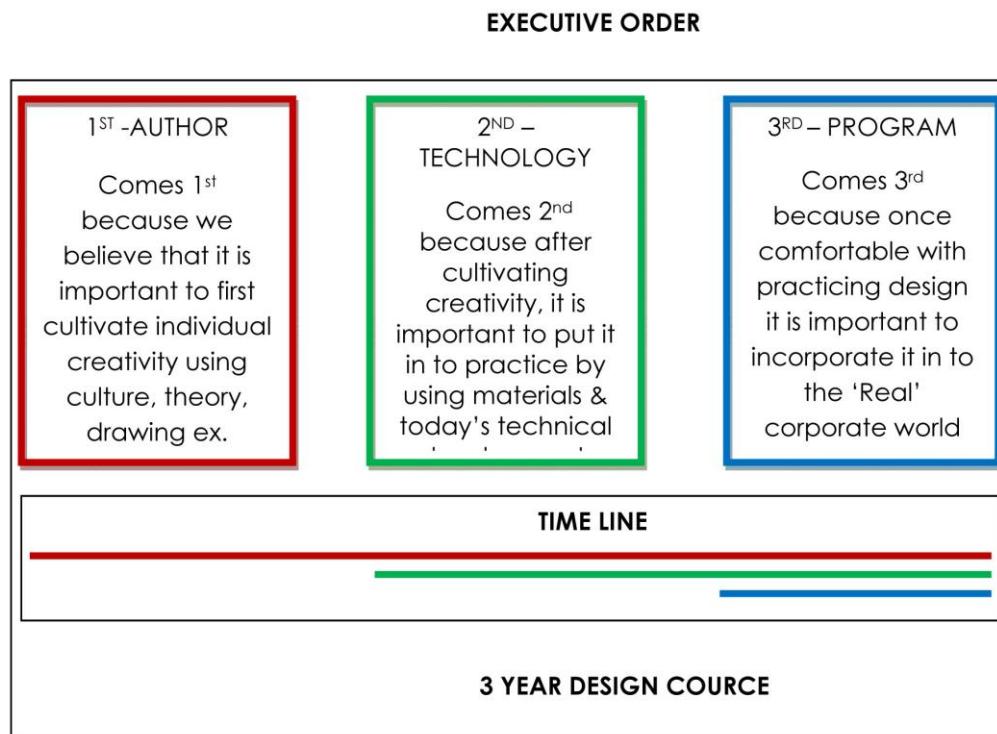
II. Would you use the above terms (as you have just defined) to best communicate your curriculum? If not please specify your terms and their definition as you understand them.

TERMS	DEFINITIONS
Problem solver	An updated idea of the designer profile
Thinker	The integrated side for a contemporary designer
Design	The reflective side for the designer education
Humancentre	The required approach to lead current curricular
Complexity	As the designer environment

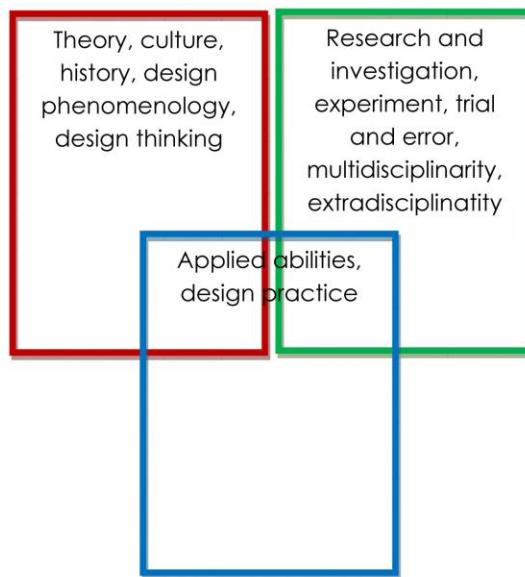
4. Hierarchy

Although all the interventions are important to create a design curriculum, we search to find out if there is a hierarchy between them and how this hierarchy is expressed.

In our design curriculum we were able to place our interventions in executive order:



- a) Do you agree with this logic of creating a hierarchy, could you incorporate your curriculum in to the same logic? (Feel free to add more boxes and alter length of lines in order to get a more accurate result for your curriculum as well as specify the course duration).



Do you have a different logic in order to communicate the hierarchy of the interventions that structure your curriculum, please specify?

The hierarchy applied in our curriculum is mainly conceptual and devoted to build a sort of in progress learning scale. Both theory and practice are meant to interact, with theory informing practice and practice being grounded in theory.

Learning and learning-in-practice are expected to drive the student progression.

What may change along the time line of progressive education in design is the increasing level of complexity at which this interaction may be articulated (very simple for naif, new comers and absolute beginners), intermediate for middle level students, highly sophisticated for advanced students.

The present status and organization of the School of Design in Milano is the result of revisions and integrations of the traditional academic framework. Historically, the Italian university has been organized on the basis of a vertical division of knowledge with the educational pathway framed as a deductive process. Until very recently, in most disciplines academic education was organized in a linear and sequential manner, with theory and related knowledge representing the starting phases of the

learning process and the technical and practical activities - the practice - deferred at the end of this process or, in some cases, to the very final phases of the curricula.

This system was revised when the recent restructuring of the academic system took place. Specifically, it has been assumed that it is not possible any longer to conceive forms of advanced education rigidly divided into compartments. Thus, the learning process is now interpreted as an inductive process, where theory and practice go side by side, with theory informing practice and practice being grounded in theory.

Current academic curricula in industrial design (first and higher degree) are expected to provide the theoretical, scientific and professional knowledge required by a practitioner for the design, manufacturing and improvement of products. The industrial product is not meant as a physical artifact only, but as the complex of factors aimed at communicating the product itself while giving it a sense (such as the aspects of graphic design and the design of brands, web sites, etc.).

The three-year first Degree programme is expected to form graduates who are design technicians, practitioners for all the technical duties required by product conception, production and distribution. The Higher Degree graduates are expected to supervise and define the strategic dimensions of design activities. These graduates are educated to be able to coordinate complex design activities, i.e. the creation of extensive and articulated product systems.

Those who have completed a Higher programme may attend a Ph.D. programme, the academic curriculum for advanced training in design research. The design area features a multifaceted Ph.D. programme (exploring the areas of product design, multimedia communication, interior design, design methods for product development, service system design, cultural heritage).

The Politecnico di Milano is a research institution and the School of Design operates under strict connection with the research units (Udrd) of the Department of Industrial Design (Indaco). While at the first degree level (Laurea, articulated into the curricula in Industrial Design - Product, Communication Design, Fashion Design and Interior design) students are not specifically exposed to an integrated process of research in the very early phases of their curricula, the concept development and the testing of the design outcomes of their degree thesis is explicitly required to be based on the evidence of some investigations. Within the curricula in product design, the basic explorations informing the degree thesis project usually include data gathering, facts assembling or case study survey, and may include - to a very limited extent - usability testing, rapid ethnography, short task analysis, rapid user profiling.

At the higher degree level (Laurea Magistrale, articulated into the curricula of industrial Design- Product, Communication Design, Fashion Design, Interior Design, Furniture Design, Yacht Design, Service System Design, Design and Engineering) there are more effective opportunities to integrate the creative design process with research activities, instilling a form of awareness of design research as a pre-requisite to a more formal approach to design research methods: at this level education in specific methodologies is reinforced by the more mature profile as a practitioner that students start to express. Starting from the first year of the higher degree level, our students are formally exposed to approaches to design research either through elective and complementary studios. These courses are solicited to open a perspective on different ways to conceive research and to relate it to design, so to

encourage design approaches where theory, practice and research are successfully integrated to sustain creative activity.

b) Do you believe that by creating a hierarchy for the interventions in a curriculum, simultaneously a priority of design skills is created?

I have no clear answer for this question.

As a general reaction I would say that introducing any hierarchy in a curriculum would result into a model of education in design that sets priorities in design learning ("this comes first, so this is a ground to build further steps").

c) Is there a specific intervention in your faculty's current curriculum that you believe needs improvement?

A couple of notes pointing out some elements which are now under discussion and which may profitably improve the curricula developments:

- (i) a research approach to design does not contradict the creative and artistic aspect of design. There's no contradiction between the aesthetic dimensions of product values and qualities and the design research criteria that may inform that product. The main difference lays in the statement that it is the parameters of a design problem that may establish the basic requirements of a design solution;
- (ii) research methods for design may (and indeed should) transform the practice of design, not the core aims of design. Although a large number of leading designers use articulated problem-solving methods - but others are not concerned with how design is done in addition to doing it - and a growing number of designers, scholars and scholar-practitioners are active in the field of design research, its the practice of design that is expected to change, not the objectives of design;
- (iii) a rigorous approach to the practice of design does not contradict the role of intuition. Although we can not know what goes in the mind of a designer and we can not know whether a design solution emerges on the base of rigorous enquiries or through an unconscious process of selection of possible alternatives in the designer mind, intuition still remains there;
- (iv) finally, fully exploiting the potentials of investigations for design implies involving a rich relationship between theory and practice, between learning and learning-in-practice, between the conceptualization of our surrounding phenomena and the understanding of phenomena themselves along the designer ability to articulate that increased understanding as conscious knowledge;
- (v) we are now specifically working at emphasising any user or human centred approach in design. A sort of user-centred axis for design courses and studios has been recently elaborated to have the design curriculum reshaped around it.

Appendix D: Survey- Questionnaire-Answers

Survey /Questionnaire

Introduction:

This questionnaire is intended to contribute to a curricular analysis which main attempt is to understand the curriculum functions of Design education at an undergraduate level. All responses will be gathered and analysed in contribution to this study.

Context

Framed in a dissertation thesis which topic is '**Curricula analyses toward the contribution to the understanding of the processes in design education; Focused on an undergraduate level**' and with the support of a strong 'body' that will serve as a point of approach, comparison, discussion and observation, among other faculties, universities and institutions grounded in intellectual and cultural biases that favour theory and practice; As well as providing a case study of the establishment of a design curriculum. In this case, the 'body' employed is the Design curriculum of the Communication and Art department of the university of Aveiro, structured by Prf. Francisco Providencia. This study aims to research the various and divers approaches of several faculties of the occidental world, and analyse the curriculum structure of their design courses. Through this analysis it is estimated to create a panoramic view of the differences and commons of the various approaches, and how each curriculum communicates its point of execution.

Please fill in your personal information.

1. Profile of the interviewee

Name: Nigel Cross

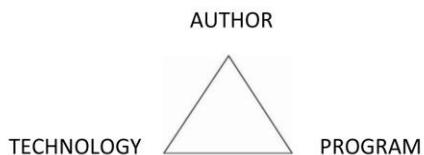
Position: Emeritus Professor of Design Studies

Faculty/Department: Open University in Milton Keynes UK

Institution: THE OPEN UNIVERSITY

2. Conceptual Model

At the University of Aveiro a conceptual triangular diagram is used to communicate the current design curriculum.

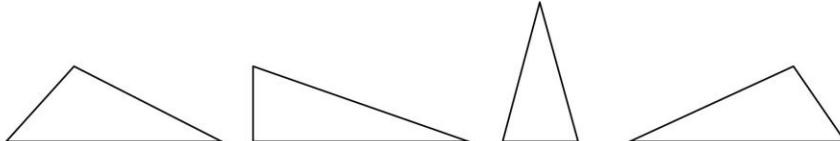


- a) **Would you use the same representation logic to communicate your Design curriculum? If not please specify?**

I would prefer a more fluid representation. This representation seems closed to the new entries. For example only thirty years ago has computers and computer aided design entered the design discipline and are now part of the conventional practice. But thirty years ago they were things only design researchers were interested in and were trying to develop. The educational design programme should be open to new developed ideas.

- Considering the curriculum experience of your faculty, would it be possible to produce a similar dialog between the variables 'Author', 'Technology' and 'Program'.
- If the weight between the above variables were not equal, which could be the mental figure produced from their relation? (Visual of your curriculum experience).

e.g.:



3. Introductive-Terminology

In our context we use the below words to communicate the 3 main interventions that together structure our curriculum.

TERMS	DEFINITIONS
AUTHOR	Individual inspiration, Operator or Designer, Culture, Theory
TECHNOLOGY	Technical development, Materials, Practice
PROGRAM	Relation between client & designer, Coexistence with outside partners

a) Building a Semantic Constellation

I. How would you define each term?

TERMS	DEFINITIONS
AUTHOR	He who produces something original. Creator or originator
TECHNOLOGY	The study of applications and combinations of resources to solve a problem.
PROGRAM	The conditions and commands connected to summaries all design and work intentions.

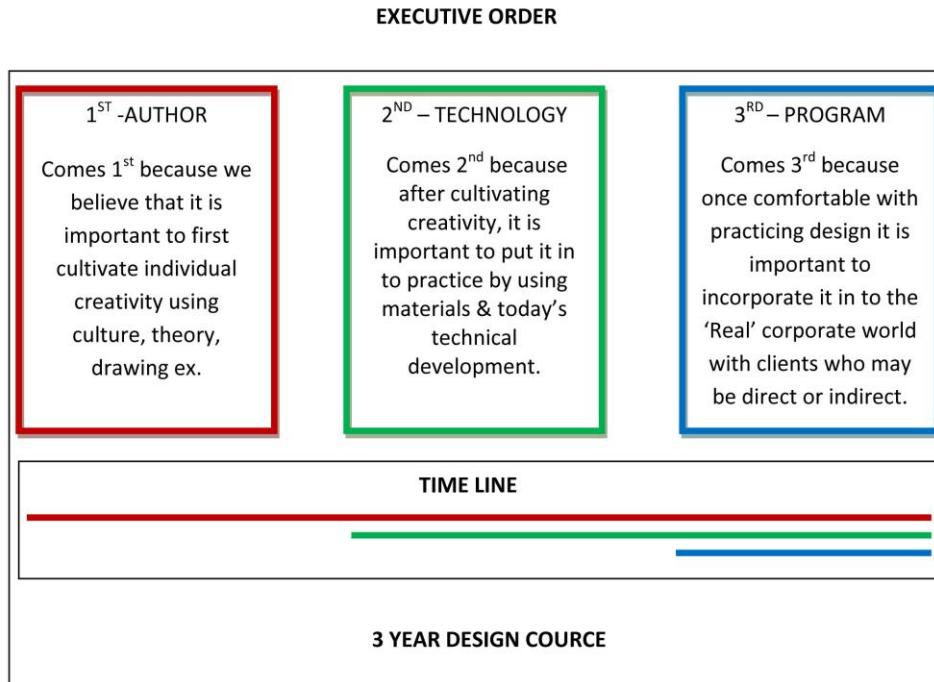
II. Would you use the above terms (as you have just defined) to best communicate your curriculum? If not please specify your terms and their definition as you understand them.

TERMS	DEFINITIONS
Design thinking	How do designers think. How one thinks about the design process. Understand what it is that people do when they
Cognitive thinking	Constructive discontent. Self confidence. Innovating criticism. How can designers make things better
Imagination (image, imagine)	Creativity. Enjoyment.

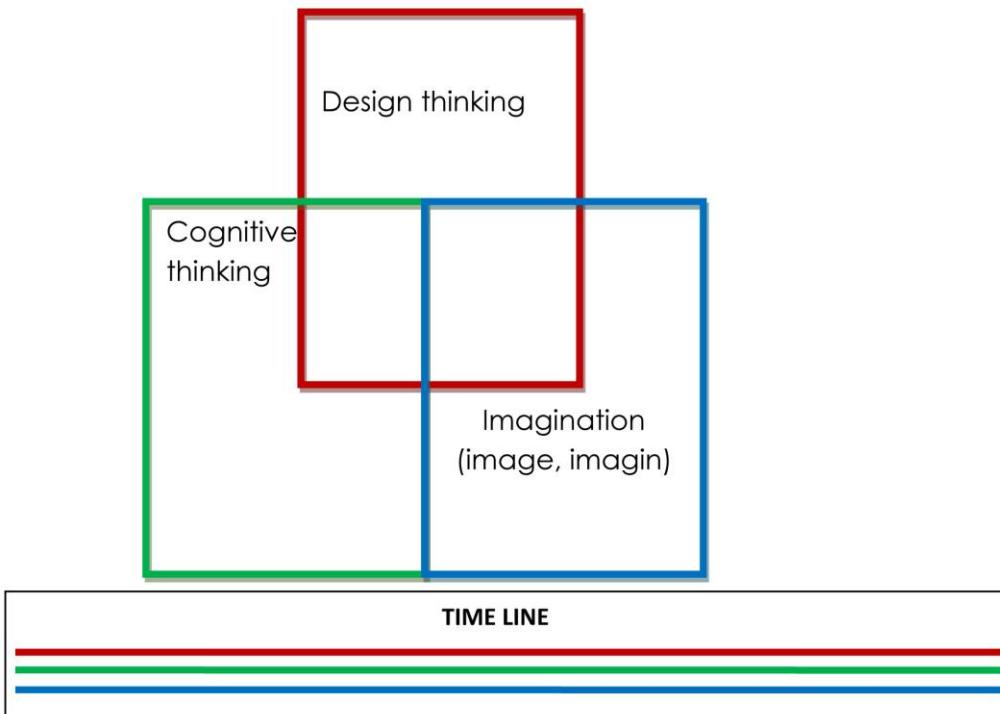
4. Hierarchy

Although all the interventions are important to create a design curriculum, we search to find out if there is a hierarchy between them and how this hierarchy is expressed.

In our design curriculum we were able to place our interventions in executive order:



- a) Do you agree with this logic of creating a hierarchy, could you incorporate your curriculum in to the same logic? (Feel free to add more boxes and alter length of lines in order to get a more accurate result for your curriculum as well as specify the course duration).



- b) Do you have a different logic in order to communicate the hierarchy of the interventions that structure your curriculum, please specify?

The programme developed at the Open University teaches something about design that is practical and useful for everybody. It is about design thinking and what kinds of thinking do you try to develop in everybody. We don't have a degree in design and the Open University degree can be a mix and match of a number of credits that the students take from all kinds of subject areas. So they can include some design in their degree, but we don't have something that is a full design degree.

- c) Do you believe that by creating a hierarchy for the interventions in a curriculum, simultaneously a priority of design skills is created?

This is not necessarily so, any hierarchy results in a design model and every model has its starting point and the point where it ends. You have to try to be clear about all the skills you are trying to teach, intellectual or cognitive skills as well as practical skills.

- d) Is there a specific intervention in your faculty's current curriculum that you believe needs improvement? Rather than continuing with the sort of craft based or apprentice based type of education working toward a more explicit

and more generalized sort of education so that you can use it in education without assuming that the students are actually going to become designers should be promoted. I think every educated person should have something about design in their education. In that case you have to find out what is intrinsically valuable in the activities of designing, in design practice which everyone should have. And that's what made me think about what it is that designers do which would be useful for everybody to have. Although the biggest challenge in the field of studying design is about maintaining and building the idea of Design an intellectual discipline, it is important to develop it and that we need a sort of bootstrapping with our younger students or new researchers coming into the field. We cannot import research from other fields, but we have to develop our own ways of doing it. The big challenge is to construct the paradigm of research, research activities and examine what we mean by that in the design world. Those are still the challenges which we had to face for the last twenty odd years and they are not yet resolved. And it is still about understanding what it is that expert and good designers do when they are designing. That is not very clear. It's still quite a mysterious thing.

Thank you very much for your co-operation.

Please return as soon as possible and before the 10th of May of 2010.

To: Natasha- Elena Christodoulou Gonçalves. / Student of the University of Aveiro / Communication & Art department / Masters Program of 2008-2010.

Email: natashaelenagoncalves@gmail.com

Orientation and Guidance by: Prof. Rui Roda & Prof. Francisco Providencia.

Appendix E: Survey- Questionnaire-Answers

Survey /Questionnaire

Introduction:

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Context

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Please fill in your personal information.

1. Profile of the interviewee

Name: Victor Margolin

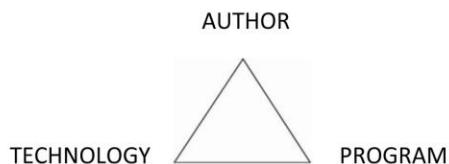
Position: Professor of Art and Design History

Faculty/Department: Architecture and Art department

Institution: University of Illinois at Chicago

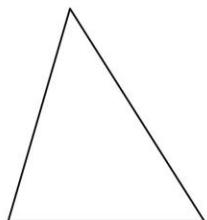
2. Conceptual Model

At the University of Aveiro a conceptual triangular diagram is used to communicate the current design curriculum.



- a) **Would you use the same representation logic to communicate your Design curriculum? If not please specify?** Yes, this is a good representation although it would probably not be so easy to keep a perfect equilibrium.
- **Considering the curriculum experience of your faculty, would it be possible to produce a similar dialog between the variables 'Author', 'Technology' and 'Program'. The Author element should be more dominant.**
 - **If the weight between the above variables were not equal, which could be the mental figure produced from their relation? (Visual of your curriculum experience).**

e.g.: AUTHOR



3. Introductory-Terminology

In our context we use the below words to communicate the 3 main interventions that together structure our curriculum.

TERMS	DEFINITIONS
AUTHOR	Individual inspiration, Operator or Designer, Culture, Theory
TECHNOLOGY	Technical development, Materials, Practice
PROGRAM	Relation between client & designer, Coexistence with outside partners

a) Building a Semantic Constellation

I. How would you define each term?

TERMS	DEFINITIONS
AUTHOR	Totality of the human-made culture. Social values.
TECHNOLOGY	Making things, technical skills,
PROGRAM	Organizing and establishing an order with which we must work.

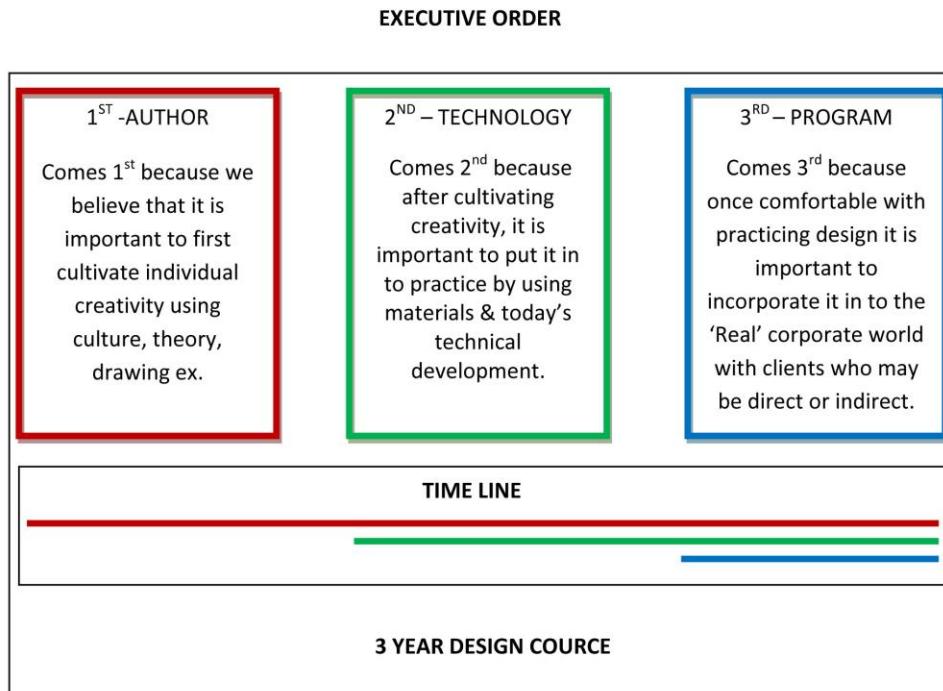
II. Would you use the above terms (as you have just defined) to best communicate your curriculum? If not please specify your terms and their definition as you understand them.

TERMS	DEFINITIONS
Personal initiative	Possibilities for action that designers find in themselves.
Capacity for invention	thought, action, object.
Problem solving	Creative and critical thinking about ways to increase the quality of life

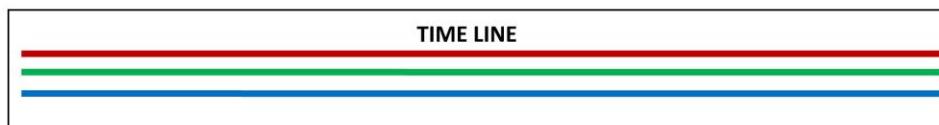
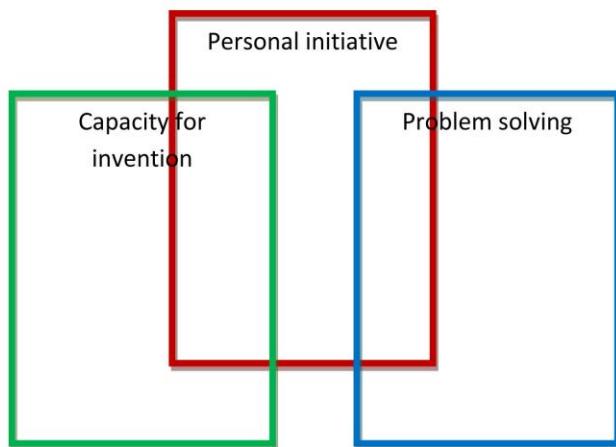
4. Hierarchy

Although all the interventions are important to create a design curriculum, we search to find out if there is a hierarchy between them and how this hierarchy is expressed.

In our design curriculum we were able to place our interventions in executive order:



- a) Do you agree with this logic of creating a hierarchy, could you incorporate your curriculum in to the same logic? (Feel free to add more boxes and alter length of lines in order to get a more accurate result for your curriculum as well as specify the course duration).



- b) Do you have a different logic in order to communicate the hierarchy of the interventions that structure your curriculum, please specify?

I developed a year-long course in design history by the patchwork approach, a teaching methodology and narrative structure that are directed to design students. I made some decisions at that time which I still find pedagogically valid. Like including both graphic design and product design in my course. I have not regretted this decision. In fact, I developed my pedagogy for my principal constituencies undergraduate majors in these two fields. My pedagogical intentions impact heavily on my style of teaching, as well as on my narrative strategies.

- c) Do you believe that by creating a hierarchy for the interventions in a curriculum, simultaneously a priority of design skills is created?
 d) Is there a specific intervention in your faculty's current curriculum that you believe needs improvement? I am optimistic that design studies will generate the development of critical literature and history. Students should at least have some exposure to the history of their chosen field as well as to the theories and critical issues within it.

Thank you very much for your co-operation.

Please return as soon as possible and before the 10th of May of 2010.

To: Natasha- Elena Christodoulou Gonçalves. / Student of the University of Aveiro / Communication & Art department / Masters Program of 2008-2010.

Email: natashaelenagoncalves@gmail.com

Orientation and Guidance by: Prof. Rui Roda & Prof. Francisco Providencia.

Appendix F: Survey- Questionnaire-Answers

Survey /Questionnaire

Introduction:

This questionnaire is intended to contribute to a curricular analysis which main attempt is to understand the curriculum functions of Design education at an undergraduate level. All responses will be gathered and analysed in contribution to this study.

Context

Framed in a dissertation thesis which topic is '**Curricula analyses toward the contribution to the understanding of the processes in design education; Focused on an undergraduate level**' and with the support of a strong 'body' that will serve as a point of approach, comparison, discussion and observation, among other faculties, universities and institutions grounded in intellectual and cultural biases that favour theory and practice; As well as providing a case study of the establishment of a design curriculum. In this case, the 'body' employed is the Design curriculum of the Communication and Art department of the university of Aveiro, structured by Prf. Francisco Providencia. This study aims to research the various and divers approaches of several faculties of the occidental world, and analyse the curriculum structure of their design courses. Through this analysis it is estimated to create a panoramic view of the differences and commons of the various approaches, and how each curriculum communicates its point of execution.

Please fill in your personal information.

1. Profile of the interviewee

Name: Costas Mantzalos

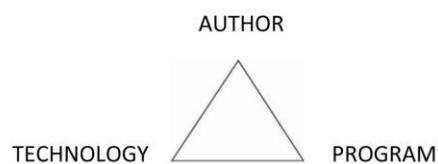
Position: Dean

Faculty/Department: School of Architecture, Fine and Applied Arts

Institution: Frederick University

2. Conceptual Model

At the University of Aveiro a conceptual triangular diagram is used to communicate the current design curriculum.



- a) **Would you use the same representation logic to communicate your Design curriculum? If not please specify?** YES
- Considering the curriculum experience of your faculty, would it be possible to produce a similar dialog between the variables 'Author', 'Technology' and 'Program'. YES
 - If the weight between the above variables were not equal, which could be the mental figure produced from their relation? (Visual of your curriculum experience).



3. Introductive-Terminology

In our context we use the below words to communicate the 3 main interventions that together structure our curriculum.

TERMS	DEFINITIONS
AUTHOR	Individual inspiration, Operator or Designer, Culture, Theory
TECHNOLOGY	Technical development, Materials, Practice
PROGRAM	Relation between client & designer, Coexistence with outside partners

a) Building a Semantic Constellation

I. How would you define each term?

TERMS	DEFINITIONS
AUTHOR	Inspiring, Aspiring and Communicative
TECHNOLOGY	Tool based subject for skill development
PROGRAM	Logical Structure that can direct learning and teaching from instruction to self-negotiated projects

II. Would you use the above terms (as you have just defined) to best communicate your curriculum? If not please specify your terms and their definition as you understand them.

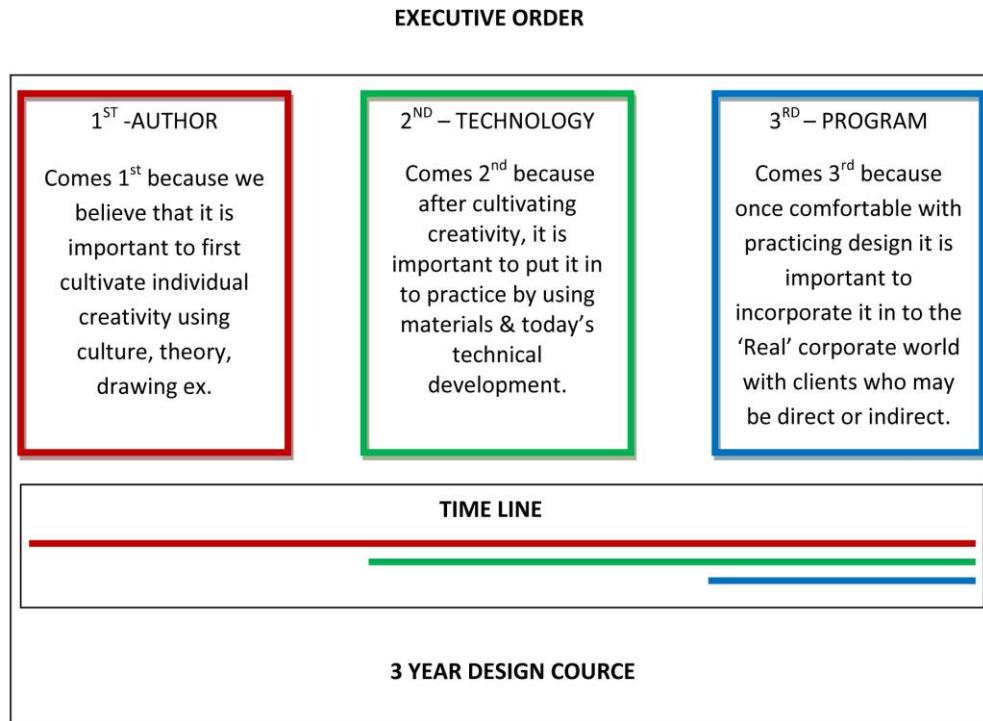
YES

TERMS	DEFINITIONS

4. Hierarchy

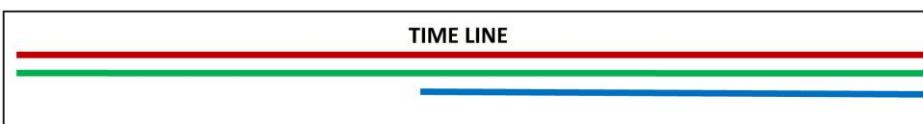
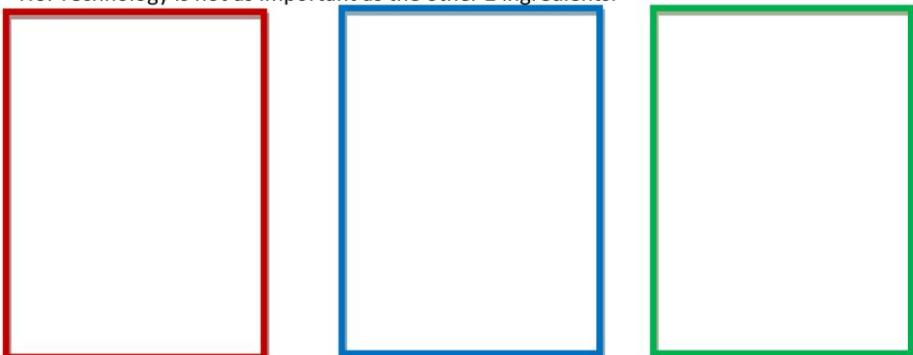
Although all the interventions are important to create a design curriculum, we search to find out if there is a hierarchy between them and how this hierarchy is expressed.

In our design curriculum we were able to place our interventions in executive order:



- a) Do you agree with this logic of creating a hierarchy, could you incorporate your curriculum in to the same logic? (Feel free to add more boxes and alter length of lines in order to get a more accurate result for your curriculum as well as specify the course duration).

No. Technology is not as important as the other 2 ingredients.



- b) Do you have a different logic in order to communicate the hierarchy of the interventions that structure your curriculum, please specify?

Yes. In all our programs we use program structure in combination with faculty above all. Of course faculty work in a community manner, with strong cross-disciplined as well as cross-course interaction.

- c) Do you believe that by creating a hierarchy for the interventions in a curriculum, simultaneously a priority of design skills is created?

Not necessarily

- d) Is there a specific intervention in your faculty's current curriculum that you believe needs improvement?

The faculty community needs working.

Thank you very much for your co-operation.

Please return as soon as possible and before the 10th of May of 2010.

To: Natasha- Elena Christodoulou Gonçalves. / Student of the University of Aveiro / Communication & Art department / Masters Program of 2008-2010.

Email: natashaelenagoncalves@gmail.com

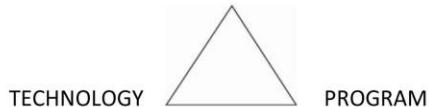
Orientation and Guidance by: Prof. Rui Roda & Prof. Francisco Providencia.

Appendix G: Survey- Questionnaire-Answers

2. Conceptual Model

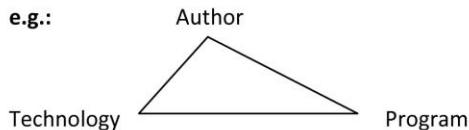
At the University of Aveiro a conceptual triangular diagram is used to communicate the current design curriculum.

AUTHOR



- a) Would you use the same representation logic to communicate your Design curriculum? If not please specify? Yes, this is quite accurate.
- Considering the curriculum experience of your faculty, would it be possible to produce a similar dialog between the variables 'Author', 'Technology' and 'Program'.
 - If the weight between the above variables were not equal, which could be the mental figure produced from their relation? (Visual of your curriculum experience).

e.g.:



3. Introductive-Terminology

In our context we use the below words to communicate the 3 main interventions that together structure our curriculum.

TERMS	DEFINITIONS
AUTHOR	Individual inspiration, Operator or Designer, Culture, Theory
TECHNOLOGY	Technical development, Materials, Practice
PROGRAM	Relation between client & designer, Coexistence with outside partners

a) Building a Semantic Constellation

I. How would you define each term?

TERMS	DEFINITIONS
AUTHOR	Communication, inspiration, creativity, imagination
TECHNOLOGY	Practical issues. Materials and tool based subjects. Development of skills. Attention to detail.
PROGRAM	Organisation, learning direction. Set Projects and self led brief.

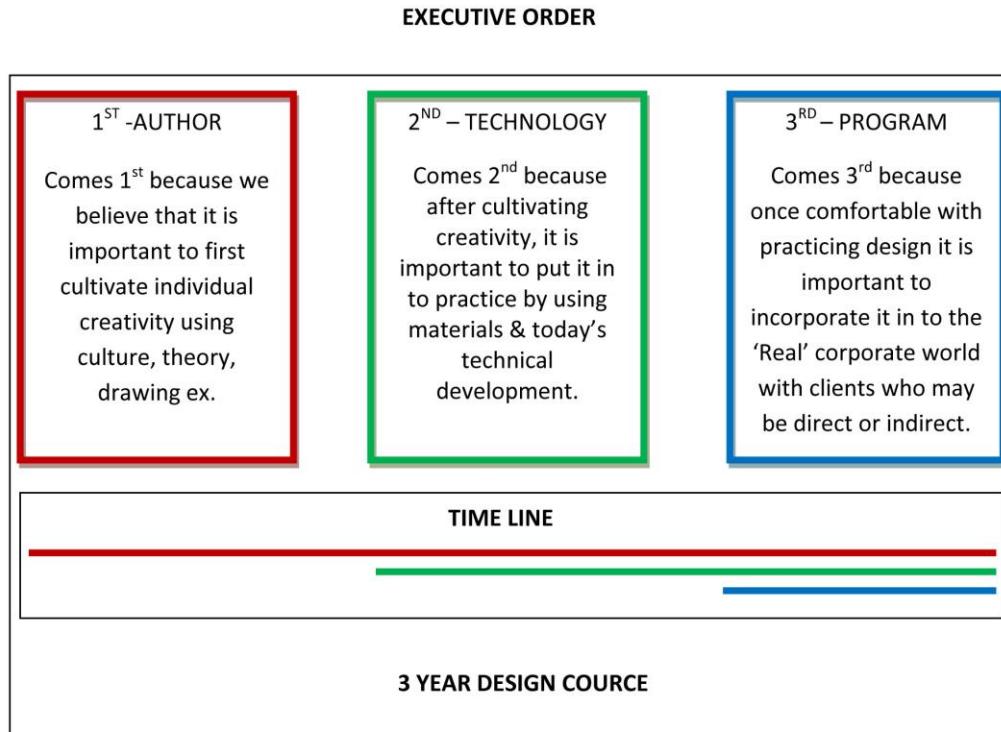
II. Would you use the above terms (as you have just defined) to best communicate your curriculum? If not please specify your terms and their definition as you understand them.

TERMS	DEFINITIONS

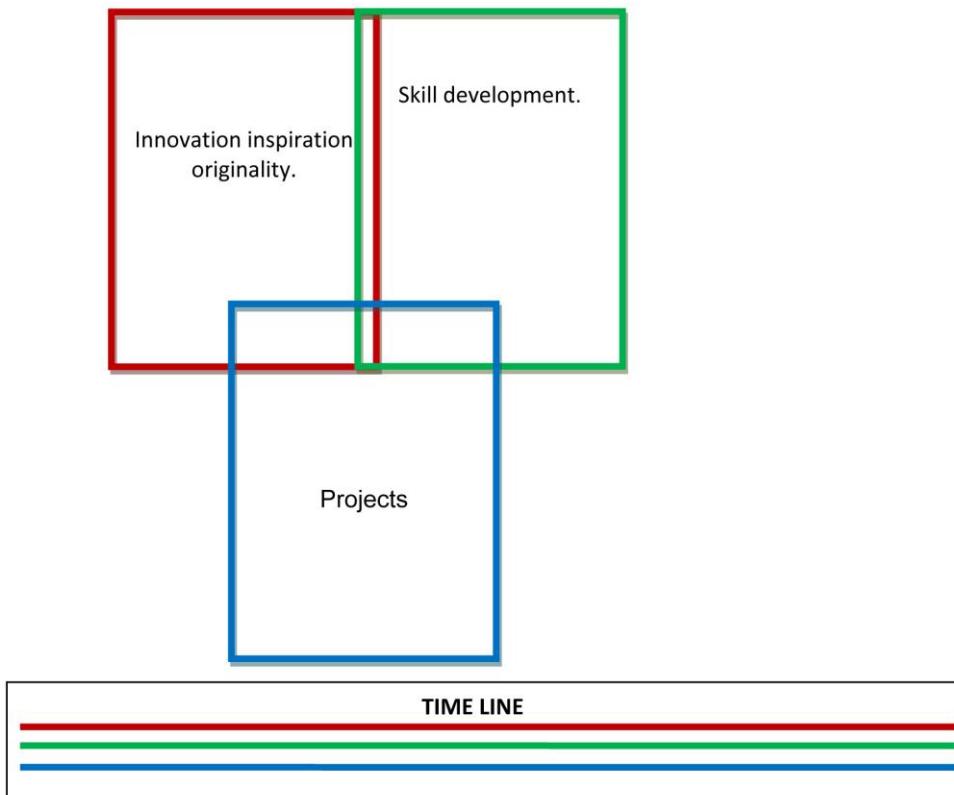
4. Hierarchy

Although all the interventions are important to create a design curriculum, we search to find out if there is a hierarchy between them and how this hierarchy is expressed.

In our design curriculum we were able to place our interventions in executive order:



- a) Do you agree with this logic of creating a hierarchy, could you incorporate your curriculum in to the same logic? (Feel free to add more boxes and alter length of lines in order to get a more accurate result for your curriculum as well as specify the course duration).



- b) Do you have a different logic in order to communicate the hierarchy of the interventions that structure your curriculum, please specify?

Within our programme structure it is most important to allowing the personal growth of students, initiating their creativity and supporting original ideas. Technical skills should be in sync with this growth.

- c) Do you believe that by creating a hierarchy for the interventions in a curriculum, simultaneously a priority of design skills is created? No I don't believe this is necessarily so.

- d) Is there a specific intervention in your faculty's current curriculum that you believe needs improvement?

The general faculty community should be improved.

Thank you very much for your co-operation.

Please return as soon as possible and before the 10th of May of 2010.

To: Natasha- Elena Christodoulou Gonçalves. / Student of the University of Aveiro / Communication & Art department / Masters Program of 2008-2010.

Email: natashaelenagoncalves@gmail.com

Orientation and Guidance by: Prof. Rui Roda & Prof. Francisco Providencia.

Appendix H: Survey- Questionnaire-Answers

Survey /Questionnaire

Introduction:

This questionnaire is intended to contribute to a curricular analysis which main attempt is to understand the curriculum functions of Design education at an undergraduate level. All responses will be gathered and analysed in contribution to this study.

Context

Framed in a dissertation thesis which topic is '**Curricula analyses toward the contribution to the understanding of the processes in design education; Focused on an undergraduate level**' and with the support of a strong 'body' that will serve as a point of approach, comparison, discussion and observation, among other faculties, universities and institutions grounded in intellectual and cultural biases that favour theory and practice; As well as providing a case study of the establishment of a design curriculum. In this case, the 'body' employed is the Design curriculum of the Communication and Art department of the university of Aveiro, structured by Prf. Francisco Providencia. This study aims to research the various and divers approaches of several faculties of the occidental world, and analyse the curriculum structure of their design courses. Through this analysis it is estimated to create a panoramic view of the differences and commons of the various approaches, and how each curriculum communicates its point of execution.

Please fill in your personal information.

1. Profile of the interviewee

Name: Chris Rust

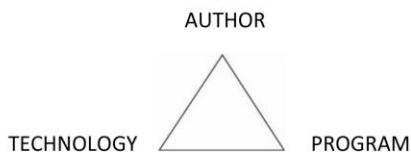
Position: Professor of Design /Development of practice- led research methods

Faculty/Department: Arts and Design Department

Institution: Sheffield Hallam University

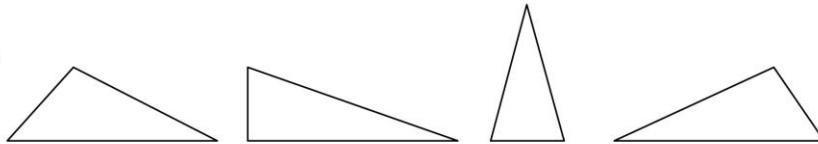
2. Conceptual Model

At the University of Aveiro a conceptual triangular diagram is used to communicate the current design curriculum.



- a) **Would you use the same representation logic to communicate your Design curriculum? If not please specify?** This is an interesting representation, although I am not quite sure if such a frame would be appropriate to describe a complex design program.
- **Considering the curriculum experience of your faculty, would it be possible to produce a similar dialog between the variables 'Author', 'Technology' and 'Program'.**
 - **If the weight between the above variables were not equal, which could be the mental figure produced from their relation? (Visual of your curriculum experience).**

e.g.:



3. Introductive-Terminology

In our context we use the below words to communicate the 3 main interventions that together structure our curriculum.

TERMS	DEFINITIONS
AUTHOR	Individual inspiration, Operator or Designer, Culture, Theory
TECHNOLOGY	Technical development, Materials, Practice
PROGRAM	Relation between client & designer, Coexistence with outside partners

a) Building a Semantic Constellation

I. How would you define each term?

TERMS	DEFINITIONS
AUTHOR	The promoter, the producer, the maker
TECHNOLOGY	Practical knowledge, Connection between science and the execution of a design project.
PROGRAM	Planing-action-fact finding-resolt of action.

II. Would you use the above terms (as you have just defined) to best communicate your curriculum? If not please specify your terms and their definition as you understand them.

TERMS	DEFINITIONS
Creative	Experimental creative work.
Craft skills	Practical system , practice-led methods.

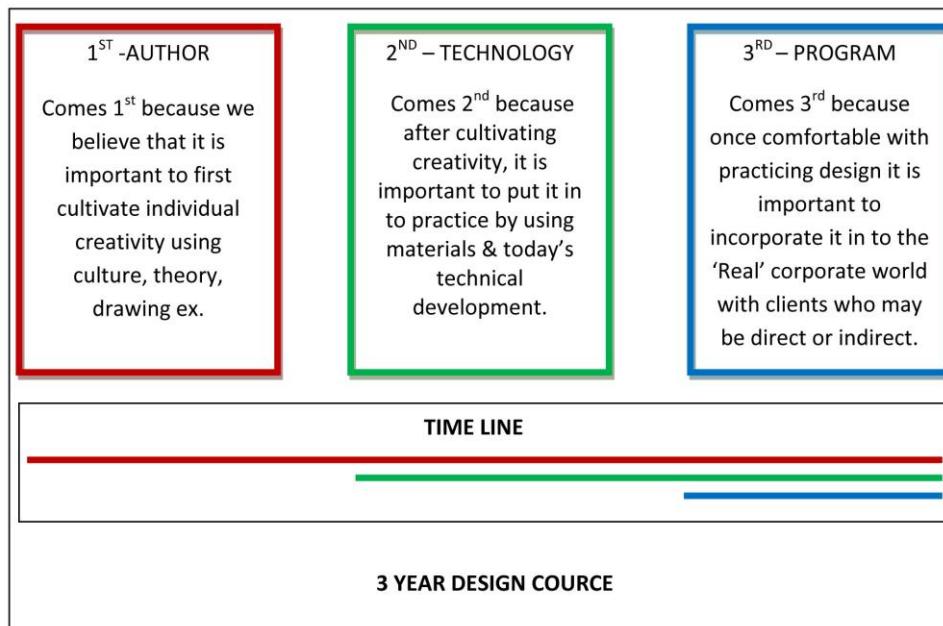
Research methods	=	Research centred education. Practice informed by contextual research. Practical methods of investigation. Embedded research methods in the core project programme.
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4. Hierarchy

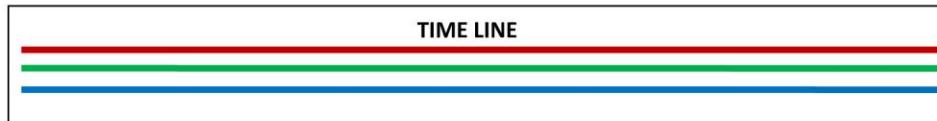
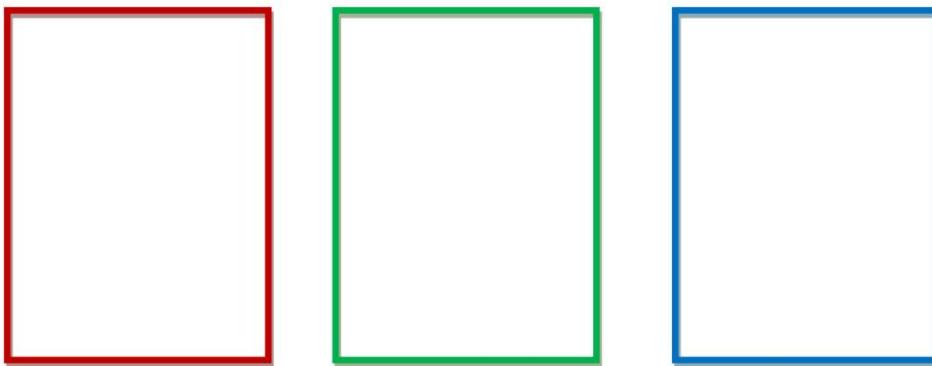
Although all the interventions are important to create a design curriculum, we search to find out if there is a hierarchy between them and how this hierarchy is expressed.

In our design curriculum we were able to place our interventions in executive order:

EXECUTIVE ORDER



- a) Do you agree with this logic of creating a hierarchy, could you incorporate your curriculum in to the same logic? (Feel free to add more boxes and alter length of lines in order to get a more accurate result for your curriculum as well as specify the course duration).



- b) Do you have a different logic in order to communicate the hierarchy of the interventions that structure your curriculum, please specify? At the Sheffield Hallam University we expect BA graduate student to engage in experimental creative work as well as at every stage of the degree. This should be the main goal of undergraduate programmes. The British Art and Design School tradition is highly focused on preparation for life in the creative professions.
- c) Do you believe that by creating a hierarchy for the interventions in a curriculum, simultaneously a priority of design skills is created? All skills are important and should be developed to the largest extent possible. This development may be affected by personal preference, talent, even by the tutor's method of introducing each aspect of the field. There is not necessarily

a priority created but this mostly leans on the personality and development of each student.

- d) **Is there a specific intervention in your faculty's current curriculum that you believe needs improvement?** By contrast to the traditional British Art and Design school, the idea that research might be important to ambitious young designers has not taken root. Our main efforts have been going in to developing a research culture within the teaching group. This created a core of academics whose research has been both distinctive and well-regarded but did not support directly the development of research degrees.

Thank you very much for your co-operation.

Please return as soon as possible and before the 30th of June of 2010.

To: Natasha- Elena Christodoulou Goncalves. / Student of the University of Aveiro / Communication & Art department / Masters Program of 2008-2010.

Email: natashaelenagoncalves@gmail.com

Orientation and Guidance by: Prof. Rui Roda & Prof. Francisco Providencia.

Appendix I: Survey- Questionnaire-Answers

Survey /Questionnaire

Introduction:

This questionnaire is intended to contribute to a curricular analysis which main attempt is to understand the curriculum functions of Design education at an undergraduate level. All responses will be gathered and analysed in contribution to this study.

Context

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Please fill in your personal information.

1. Profile of the interviewee

Name: Dijon de Moraes

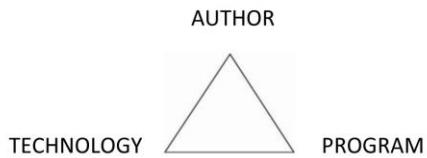
Position: Vice-Rector and Professor Theory and Design

Faculty/Department: School of Design

Institution: Universidade de Estado de Minas Gerais -UEMG

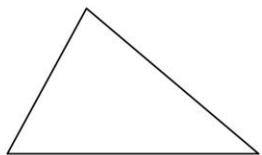
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- Considering the curriculum experience of your faculty, would it be possible to produce a similar dialog between the variables 'Author', 'Technology' and 'Program'.
 - If the weight between the above variables were not equal, which could be the mental figure produced from their relation? (Visual of your curriculum experience).

e.g.:



3. Introductive-Terminology

In our context we use the below words to communicate the 3 main interventions that together structure our curriculum.

TERMS	DEFINITIONS
AUTHOR	Individual inspiration, Operator or Designer, Culture, Theory
TECHNOLOGY	Technical development, Materials, Practice
PROGRAM	Relation between client & designer, Coexistence with outside partners

a) Building a Semantic Constellation

I. How would you define each term?

TERMS	DEFINITIONS
AUTHOR	Cultural knowledge.
TECHNOLOGY	Technological knowledge, dominance and practice.
PROGRAM	The active designer in the working market. The contact with projects.

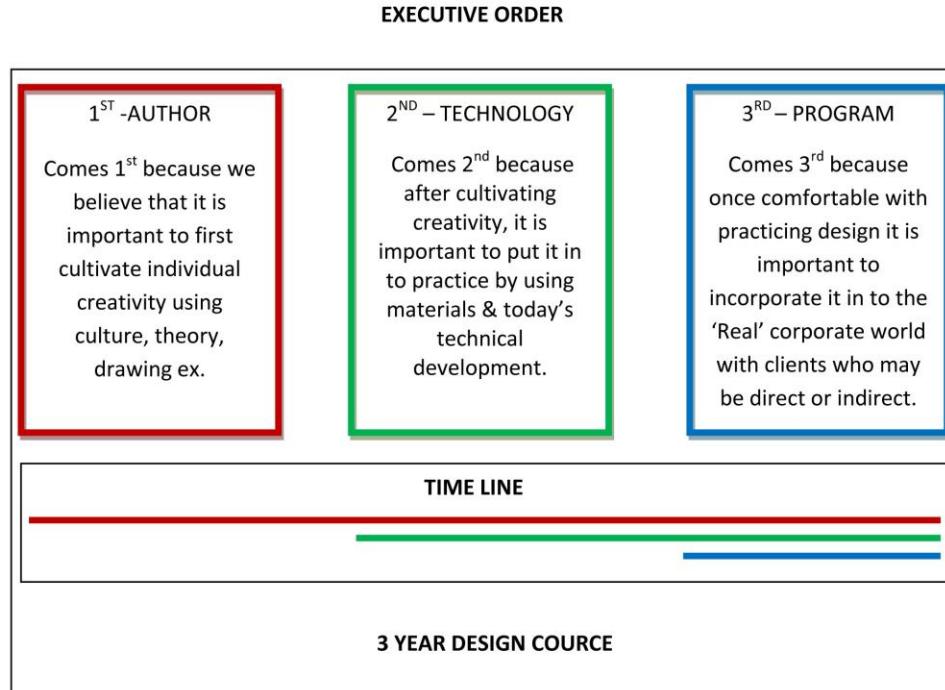
II. Would you use the above terms (as you have just defined) to best communicate your curriculum? If not please specify your terms and their definition as you understand them.

TERMS	DEFINITIONS

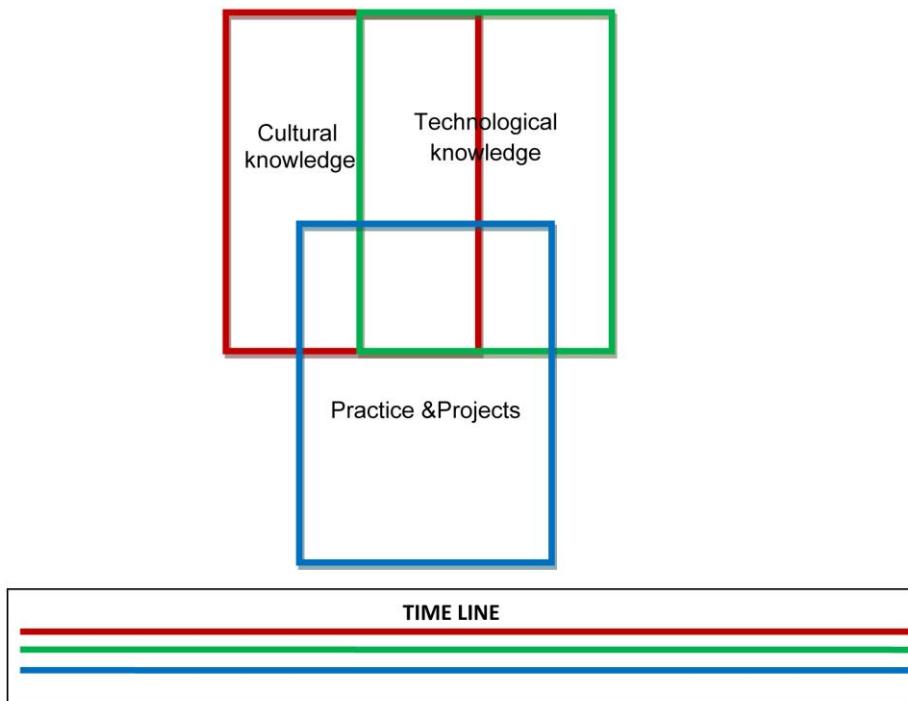
4. Hierarchy

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In our design curriculum we were able to place our interventions in executive order:



- a) Do you agree with this logic of creating a hierarchy, could you incorporate your curriculum in to the same logic? (Feel free to add more boxes and alter length of lines in order to get a more accurate result for your curriculum as well as specify the course duration).



- b) Do you have a different logic in order to communicate the hierarchy of the interventions that structure your curriculum, please specify?

Technical and Cultural knowledge should have a time limit to absorb and mature obtained knowledge so it can return in positive results.

- c) Do you believe that by creating a hierarchy for the interventions in a curriculum, simultaneously a priority of design skills is created?

- d) Is there a specific intervention in your faculty's current curriculum that you believe needs improvement?

One of the errors committed is the persistence and continuity in using active professionals that have had success in their work and more experience as reference to the students. This has as consequence the creation of limits when it comes to diversification which is necessary in our field and creates a feeling of anxiety and inferiority making the student more reserved which harms the learning process and students progress.

Thank you very much for your co-operation.

Please return as soon as possible and before the 10th of May of 2010.

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