



TEACHING DRAWING BASED ON THE DESIGN PROCESS – EXPLORING CREATIVITY

A. Zimmermann¹, S. G. Coutinho²

¹Design Department, University of the Santa Catarina State/UFSC, Florianópolis, Brazil

²Design Department, Federal University of Pernambuco/UFPE, Recife, Brazil

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Abstract: The teaching of drawing in BA Graphic Design courses in Brazil is frequently associated with paradigms mainly based on the development of technical skills. However, studies into drawing reveal it to be more than a simple representation, it is an important way of thinking for designers, connecting fields of knowledge and exploring creativity. Therefore, this study aimed to establish a proposal for teaching drawing linked to the foundations of the design process, exploring the diverse roles of drawing and ways of stimulating creativity. In order to achieve that, the study included a literature review and an Action Research exploring experiences of teaching drawing. The data was categorised and analysed through the Model of Activity System, establishing the foundation for the development of the proposal.

Keywords: *drawing, graphic design, education*

1. Introduction

Contemporary studies into drawing and design suggest new possibilities of pedagogical approaches of teaching drawing, going beyond the development of technical skills and considering its practice as part of cognitive processes, of the translation of thoughts, reconfiguration of solutions, evaluation of ideas, and developing innovations. Based on this, the main goal of this study was to establish a new proposal for teaching drawing in higher education in a Graphic Design course in Brazil, linking it with the foundations of the design process and exploring creativity in a pedagogical manner. The study started with a literature review of the field, establishing the basis for an Action Research in a Design course. The Action Research had the aim of exploring new pedagogies with the students, followed by an analysis of their activities into the system involved. Some of those activities developed during the research are briefly described and exemplified. Finally, part of the data collected was summarized and analysed through the Model of Activity System (Engeström, 2001), pointing to some new perspectives in teaching drawing.

2. Drawing Research and Education: theoretical framework

The literature review includes studies into drawing, considering the following topics:

2.1 A definition and a taxonomy of drawing

Farthing (2011) developed a definition of drawing, which notes that as well as words, numbers and notations (e.g., music) drawing is a translation of multi-dimensional events into two-dimensional,

comprehensible information. This definition considers that multidimensional events may or may not physically exist and it suggests that the meaning of a drawing is related to the context in which it was made and to its observer. Moreover, it relates drawing to the human need for communication, recording, building and rebuilding the world around them or translating their imagination, without limiting it to a particular area of knowledge, specific type, techniques, materials or supports. Therefore, it includes sketches, technical drawings, diagrams, illustrations, cartoons, maps, geometric drawings, tattoos, stick drawings in the sand and drawings produced by digital tools, among many others. In addition, this definition approaches drawing as an important way of communication across disciplines and goes beyond technical skills. Using this definition, Farthing (2011) developed a taxonomy model of drawing according to two main categories: Pictorial and Conceptual drawings. The difference between them is substantially related to how they are read and how the information contained is accessed, instead of their tools or media. For example, Conceptual drawings "rely on a more complex translation process that is dependant on our ability to read and make sense of abstractions" (Farthing, 2011, p.23). They "don't have a built in narrative. Their narrative is either located in the margin or somewhere beyond." (Farthing, 2011, p.23). Some examples of Conceptual drawings are diagrams and sketches in the early stages of a project, which refer to visual elaborations that do not necessarily bear a direct relation to their representations. However, Pictorial drawing involves the ability to recognise elements from the relationship between shapes or outlines and the exterior appearances of something. These categories do not have strict limits. Understanding these categories can help designers appreciate that the different stages of designing need different types of drawings, sometimes more conceptual, sometimes more pictorial.

2.2. Drawing in the design process

More than drawing as an end, studies into design have shown that the practice of drawing plays an important role in the design process. For instance, Cross (2011) developed a study in which he observed the roles of sketching in the designer's cognitive and creative processes. This study noted that many designers consider sketching to be a reflective dialogue established between themselves, their ideas and the sheet of paper. It is a form of continuous dialogue that ceases when thoughts are clarified and a solution appears. The study also identified that sketching allows designers to study many aspects of the same problem simultaneously, involving different levels of abstraction. This flexibility also offers the possibility of a segmentation of a problem and of grouping its parts in various ways. Thus, sketching allows designers to test their ideas in many combinations, anticipating problems quickly and without significant technical effort. Moreover, the researcher noticed that "Like writing, drawing is more than simply an external memory aid; it enables and promotes the kinds of thinking that are relevant to the particular cognitive tasks of design thinking." (Cross, 2011, p. 36). Also, Goel (1995) developed a study based on the activity of sketching by designers. He focused on the investigation of the cognitive differences between the process of freehand drawings and sketching using digital tools. He observed that: "[...] freehand sketches - in virtue of being syntactically and/or semantically dense and/or ambiguous - play an important role in the creative, explorative, open-ended phase of problem solving. This role includes facilitating lateral transformations and preventing early fixation or crystallization via a dense ordering of syntactic and semantic elements." (Goel, 1995, p.218). Furthermore, the researcher noticed that many designers use symbolic systems according to particular steps of the design process. Thus, the author considers the handmade sketches as a kind of symbolic system that is not tied to just one syntactic or semantic ordering. Therefore, even sketching, that is usually considered as one category of drawing, can play diverse roles in the design process.

2.3. Drawing in the design courses: pedagogical approaches

Some studies concerning ways of teaching drawing in BA Design courses have been developed investigating teaching strategies, developing cross-disciplinary activities throughout the curriculum. For instance, Schaerbeek and Heylighen (2012) formulated a proposal linking the activity of building three-dimensional models with the aim of exploring diverse types of drawing, modelling, and representation of structures mainly used in architecture. They called the project "teaching design-based drawing". In another example, Cabau (2011) developed a series of drawing activities based on

games, exploring architectural and product design problems, mainly using conceptual drawings. According to the author, the drawing classes must be associated with examples of professional practice in order to provide a comprehensive understanding. Samara (2012), presented examples of activities into drawing and graphic design exploring sketches in the early stages of a project, observational drawings of structures, illustrations of narratives and drawing of typefaces. The author emphasized the need to update the methods of teaching drawing in the Graphic Design courses, following the aesthetic and technological changes in the design field. Summing up, these examples of approaches show that drawing classes are not limited to the training of technical skills, but also explore the variety of roles in the design process, stimulating new pedagogical possibilities.

3. Action Research

Action Research concerns systematic reflections on specific actions in a real social situation. The researcher is not merely an observer, they also influence and aim to modify the situation. This study included an Action Research with the aim of investigating new approaches to teaching drawing in a BA Graphic Design course, scrutinizing drawing concepts, methods of teaching and learning and establishing relationships between drawing and designing. It included the participation of the researcher as a lecturer of drawing classes in a BA Design Course at the Federal University of Pernambuco (UFPE), in Brazil. The classes, entitled Drawing Laboratory for Design, included 60 hours of activities undertaken over a semester (15 meetings/4hour per week) with 24 participants. The data was collected through questionnaires (at the beginning and end of the semester), filming, field diary and drawings done by the students. The analyses followed the method of Content Analysis (Bardin, 2004) according to the steps: pre-analysis, categorization, and interpretation. Ethical permission was granted for the research according to the UFPE Ethics Committee.

3.1 Previous experiences in learning drawing: context and competences

The first activity, to gain knowledge of their previous experiences in drawing, the students answered a questionnaire in which they described activities at school, in the Design course, and their understanding of drawing as part of designing. Afterwards, the students discussed the theme collectively, exploring the answers and suggesting new approaches for the classes.

According to them, their experiences of drawing activities in Basic Education in school, were mainly in art or mathematics classes. In art, free drawings or reproductions of works were prominent, while in mathematics drawings were mainly based on studies of geometry. In both disciplines, students reported "the teacher presented the content and gave the assignments without proposing any critical, collective discussions of content, activities and rules." Moreover, the teachers seldom established a clear relationship between drawing and its roles in everyday life. Another aspect was that the practice of drawing was usually associated with a natural gift, denoting the "talented". There was no incentive for all students to learn how to draw. However, all students liked drawing and drew at home, sharing their experiences with friends and trying to learn from sources such as the internet or magazines.

Concerning their previous experience in studying drawing at University, most of their drawing classes were related to observational or geometric drawings and these experiences did not have a clear relation to the design process. The drawing activities usually had an end in themselves.

Considering this data, the model of teaching drawing at the UFPE was identified as shown in Model 1 (Figure 1); drawing is taught mainly to provide basic representational skills with no clear interaction with other subjects in the curriculum. The evaluation of drawing is subordinate to the evaluation of representational skills.

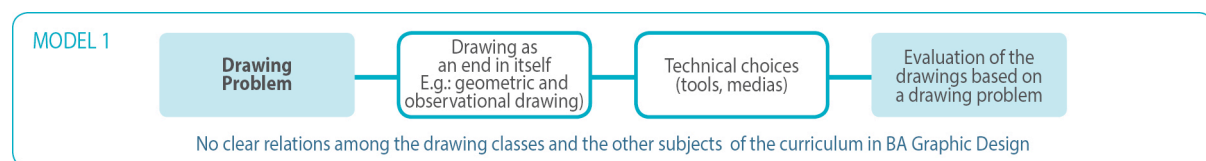


Figure 1. Models of drawing classes in a Design Course/UFPE. (Elaborated by the author).

From this analysis, a need was identified to use a theoretical support to comprehend not only the activity of drawing, but the educational system in which it takes place, considering its context and the roles that this context plays through the learning process. Thus, the Systemic Model of Activity was chosen to support this context analysis.

3.2 Systemic Model of Activity

This model is used to analyse work and study activities, considering groups of people and their context, and suggests that to study an activity one should consider the wider context that goes beyond the tasks performed by the subjects, according to the diagram below (Figure 2).

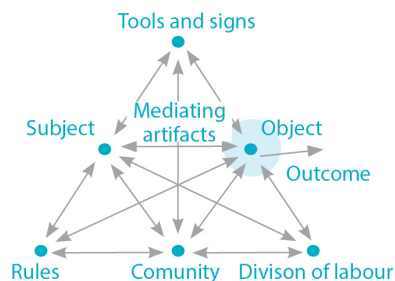


Figure 2. Systemic Model of Activity (Adapted from Engeström, 2001, p. 135)

This model assumes that the social relations between individuals, including their historical backgrounds, not only influence their cultural beliefs but also affect their ways of thinking and acting. Actions are always directed towards goals, which can vary among the subjects. Moreover, the tools and signs play important roles in the system because they mediate the relations. From time to time, the system can change, however, to achieve that there is a need for critically analysing the contradictions of the system, searching for common goals, changes in the rules, or any other aspect of the system. Based on that, the next step for developing a new approach of teaching drawing started by questioning the current system, as shown in the following topic.

3.3 Systemic Model of Activity of the drawing classes: questioning the system categorizing data

The questions bellow were raised at the beginning of the semester, expressed in the questionnaire and group conversations between the tutor and the students. The data was categorized according to the Systemic Model of Activity (Figure 3).

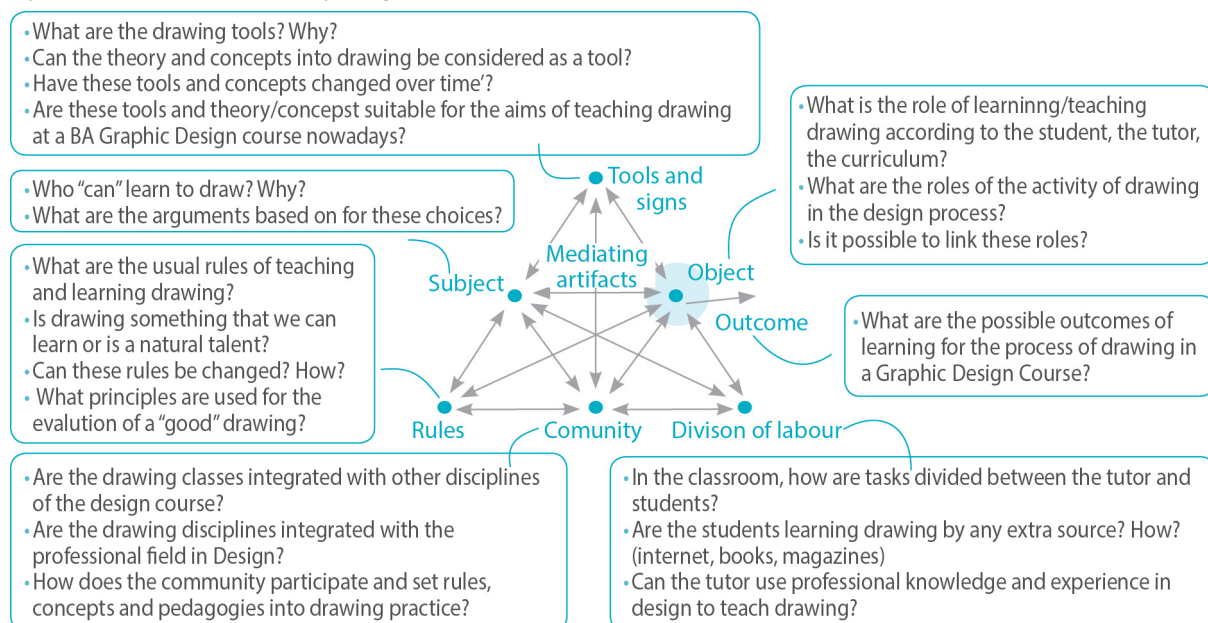


Figure 3. Some issues raised by participants. (Elaborated by the author, adapted from Engeström, 2001, p. 136)

3.4 Redesigning the Systemic Model of Activity of the drawing classes

The discussion, noted above, of the issues among the participants of the Action Research during the semester, and the analyses of the experiences during the classes suggested the bases for some changes to the Model Activity, being:

Subjects: Students and tutor considered as subjects

Object: Tutor and students share the same goals

Tools and signs: Should include, besides the updating of technical tools, the updating of conceptual, communicational, pedagogical and learning tools.

Social roles: Students should assume a critical attitude, as individuals and as a group; sharing doubts, information and knowledge concerning the activities, their evaluation, and their relation to the curriculum and professional practices.

Community: Expand beyond the drawing classes, include other disciplines in the curriculum, other sources of knowledge already used by the students and professionals in the field.

Division of labour: Students should be responsible for developing the activities (individually or in groups) as well for analysing, evaluation, criticising and suggesting changes, based on a common goal. The tutor should be responsible for explaining the activities, encouraging a critical attitude, establishing connections between subjects and note particular needs and readjustments of teaching methods and content. Other sources for learning drawing, e.g. magazines and websites should be part of the division of labour, as well as the designers, sharing their experience of drawing and design.

Finally, the data above was categorized and summarized according to the diagram below, establishing a new Activity System (Figure 4) for the drawing classes:

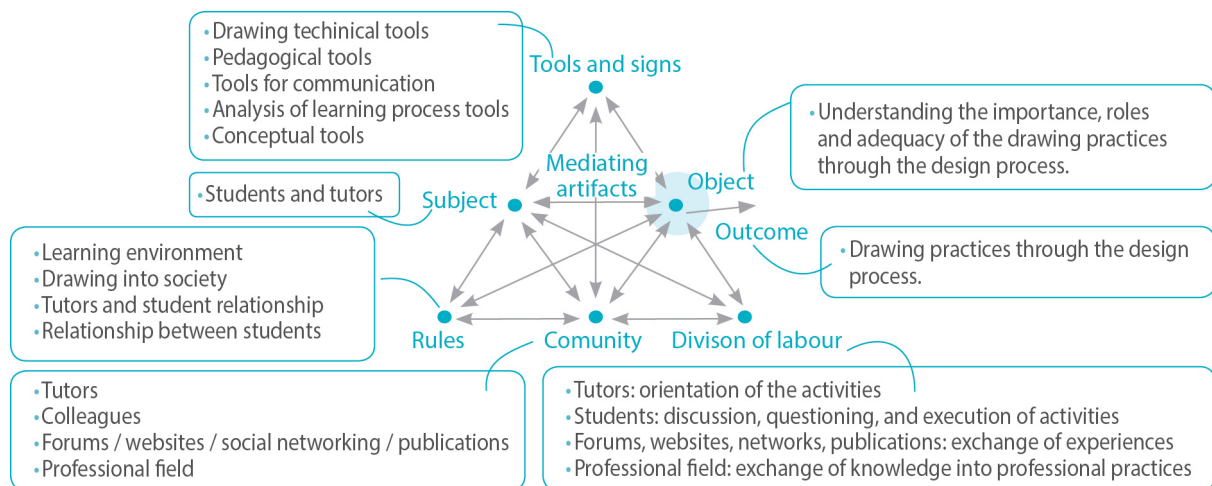


Figure 4. Activity System proposed for the drawing classes. (Adapted from Engeström, 2001, p. 135).

3.5 Some examples of drawing activities developed during the Action Research

The activities were mainly structured according to the design process, exploring the different forms and diverse roles played by drawing, extending it across the curriculum, exploring cross-disciplinary possibilities, including the study and practice of both the Pictorial and Conceptual drawings. Some examples are:

Activity 1: One of the first activities of the drawing classes was based on studies of Cross (2011). Students read one of his articles concerning the importance of sketching in the design process and translated its main ideas into drawings and notations (Figure 5). Subsequently, students discussed the article.

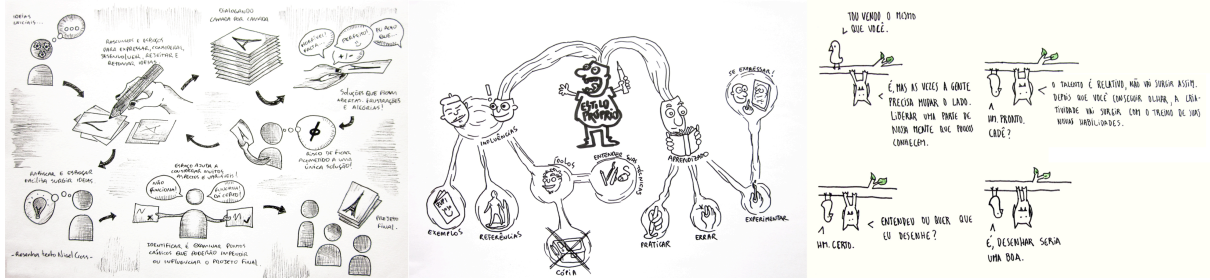


Figure 5. Notations regarding the importance of sketching for designers based on Cross (2011). (March, 2013).

Activity 2: This activity was based on the roles of drawing in Information Design. The students created a series of illustrations, explaining how certain actions were to be performed correctly. This activity combined the exercise of Conceptual and Pictorial drawings, observation, composition, the practice of freehand and the use of photography and CAD system in different stages of the process, as well as different drawing techniques according to the goals. This activity established relations between subjects that form part of the curriculum as methodology in design, photography, and information design. Steps in the exercise were: defining a problem of information design to be clarified through drawing, studying conceptual solutions, taking photographs of the action to help think about composition, synthesizing the information through drawing, exploring tools and materials, and developing a final layout (Figure 6).

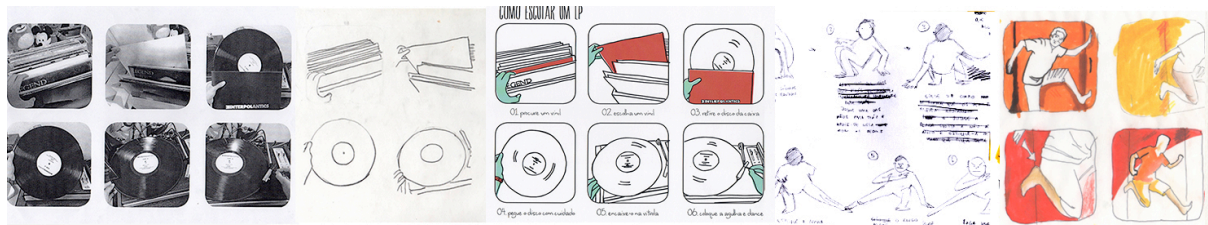


Figure 6. Drawing for Information Design: freehand drawings, photographs and CAD drawings. (July, 2013).

Activity 3: This activity was focused on the study of Biomimetics in designing. The activity was conducted in groups and had the goal of exercising Conceptual drawings and practicing drawing as a way of communication among members of a group. The students should develop ideas for packages, studying the peel and parts of fruits and cereals (Figure 7). This activity, besides stimulating the practice of drawing as a way of thinking and communicating, also led to a discussion of the use of biomimetics and its contributions to creativity in design.



Figure 7. Biomimetic investigation through drawing (July, 2013).

Activity 4: The aim was to develop an informational guide illustrating ways to represent light and shadow through drawing. For this activity, the students had to create a guide mainly using drawings, representing observations made through using a lamp and three-dimensional shapes made in a variety of colours and materials. They had to work in groups, using sketches to explain conceptual ideas to the others. The guide became a reference for representations of light and shadow through following activities of the classes. (Figure 8).

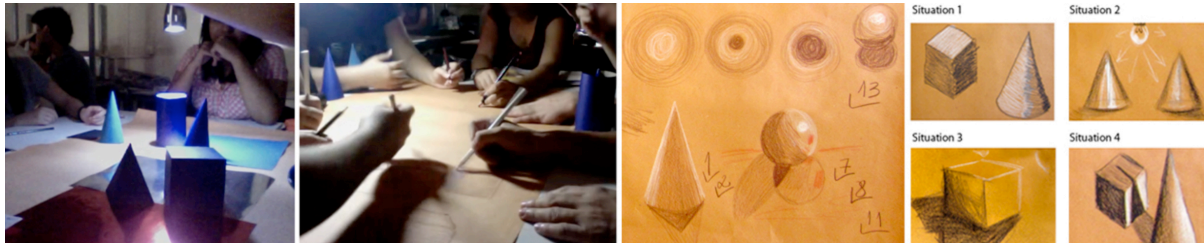


Figure 8. Investigation of light and shadow through conceptual and pictorial drawings (August, 2013)

4 Building a proposal for teaching drawing: discussing the outcomes

The analysis clarified that an educational environment is a complex system which includes the students, the tutor, the institutions, as well as the social rules and paradigms in education. Therefore, changing something in the system requires changing several tools, rules and relations inside the system. For example, the goal of exploring the roles of drawing in the design process required the study and discussion of the concepts of drawing (conceptual tools) between the students and tutor. Therefore, part of the literature review studied by the researcher was also shared with the students. Moreover, to enhance the perception of the students through the learning process of drawing, it was important to discuss all the steps of the activities, their relation to the goals and to show their practical roles in the design process. Finally, it was observed that drawing can stimulate and help the creative design process through a collaborative environment, stimulating creativity as an act of sharing resources, combining ideas and exploring diverse ways of thinking. These aspects can be observed from the evaluation of the classes given by students through the questionnaire at the end of the Action Research. Some of their observations were:

Question: *After the drawing classes, did you change your view concerning the importance of drawing in Design? How?*

Answers:

- *When I started the BA course I soon discovered that drawing was not the main focus, these classes influenced the final result of other activities so much during the course, that now I believe ignoring the importance of drawing is a major mistake.*
- *I always found drawing important, but as I did not know how to draw, I used to diminish its importance not feel at a disadvantage. Now I see that I still have a lot to learn, but I have taken an important step in this process. I am very excited about taking more drawing classes.*
- *I always thought that drawing was essential for the designer to be a better professional, not only to make more beautiful products but to communicate better. The classes helped reinforce what I already knew, especially by observing how much my colleagues improved, not only in the drawing classes but also in other subjects in the course.*
- *I already knew how important it is, but after the classes, I came to believe it even more. Nowadays I can not show any idea without drawing it.*
- *Drawing opens the door of creativity. [...]. My sagacity to solve design issues improved a lot after these classes.*

Question: *During the activities of the semester, was the relationship between drawing activities and their application to the professional field clear? How?*

Answers:

- *Yes, I realized that drawing is important for designing, no matter what has to be designed.*
- *Yes. Mainly from the examples, showing the importance and roles of drawing, from a simple sketch to a more elaborated rendering.*
- *Very clear. Now [...] I stop in front of a sheet of paper and I draw what I understand of the subject, something that I did not previously do because of the fear of drawing. I test letterings for logos, illustrations for posters, everything.*
- *I understood this relationship before, but now I realize that it is much greater than I had imagined.*

- Yes. From the sketch to the rendering, the roles were clear for each technique and when they can be best used during the process of creating a product or a graphic project.

Therefore, considering the results of the Action Research a suggestion for a new model for the drawing classes in the Graphic Design Course was constructed, shown in Figure 9.

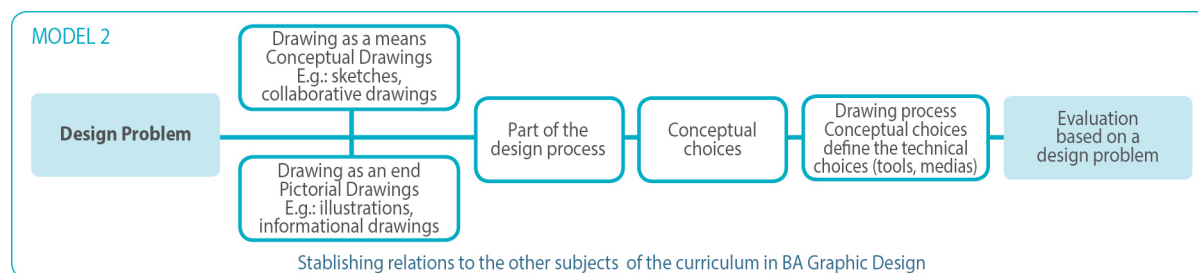


Figure 9. Model of drawing classes for a Graphic Design Course. (Elaborated by the author).

According to this model, the drawing activities in the classes must start from a design problem, exploring the practice in drawing as a means (Conceptual drawings) and as an end (Pictorial drawings). Therefore, technical choices are conditioned to conceptual choices, in other words, the technique is used as a way to develop concepts. Finally, the evaluation of the results refers to the whole process of the activity according to the design problem addressed.

5. Conclusions

The analysis of the data collected during the Action Research showed multiple interactions between diverse elements and subjects that took part in the system of teaching drawing. Therefore, thinking about an educational proposal requires broadening the view of its context, the analysis of paradigms in education, an understanding of the curriculum as a system and not as a range of subjects, a review and increase of the tools, a view of the professional environment and sharing common, conceptual bases and a definition of clear goals among all the participants. Moreover, this study showed that the practice of drawing can develop and stimulate the creativity of designers, connecting the drawing classes to the process of designing and can also enhance, invigorate and stimulate new creative pedagogies in teaching drawing in Design courses. Finally, for future studies, we suggest a deeper analysis of the data according to each element of the Model of Activity System, amplifying the debate into this field among researchers, tutors and designers.

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