Freehand drawing and digital representation: a discussion in the architectonic projective process

RESUMEN. Este artículo se refiere a una investigación cuyo tema es la relación entre los medios de representación, principalmente los bocetos a mano alzada, y, la conciencia crítica urbana o arquitectónica del espacio. Hoy en día, las computadoras y los medios de comunicación se ha mejorado constantemente, y, además de esta evolución, también los medios de representación se ven influidos por las mejoras tecnológicas. Teniendo en cuenta estas innovaciones, este artículo tiene como objetivo reanudar el debate sobre el papel del dibujo a mano alzada en el caso del proceso arquitectónico proyectivo y también para sugerir un acercamiento con el dibujo realizado por los experimentos en el área de representación digital. Esta investigación es apoyada por los resultados de una enseñanza interdisciplinaria de las prácticas desarrolladas en el primer año del Curso de Arquitectura y Urbanismo (Instituto de Arquitetura e Urbanismo da Universidade de São Paulo).

PALABRAS CLAVE: boceto, dibujo a mano alzada, el proceso de proyección arquitectónica

ABSTRACT. This paper regards to a research which subject is the relationship between the means of representation, mainly the freehand sketches, and, the urban or architectural critical awareness of the space. Nowadays, computers and the communication means are been constantly improved, and, besides this evolution, also the means of representation are influenced by the technological enhancements. Considering these apparently one-way innovations, this article aims to resume the discussion about the role of the freehand drawing in the case of the architectonic projective process and also to suggest a rapprochement with the sketch performed by experiments in the digital representation area. This research is supported by the results of an interdisciplinary teaching practices developed in the first year of the Architecture and Urbanism´s Course (Instituto de Arquitetura e Urbanismo da Universidade de São Paulo).

KEYWORDS: sketch; freehand drawing; architectonic projective process.

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Freehand drawing and digital representation: a discussion in the architectonic projective process

Regarding the meaning of drawing in architecture, it is essential to define the kind of representation: observation drawing, creative design, artistic design, freehand drawing, technical drawing, done with use of specific instruments, drawing made with the aid of the computer. The word "drawing" encompasses several approaches. This text concern is the relationship between the means of representation, with emphasis on freehand drawing, and the critical consciousness of spatiality, whether urban or architectural.

In the historical context, the design has always been present as a projective practice: a practice that addresses the immediacy and the accuracy. In the case of architecture, from a specific tradition - the technical drawing - to another, with the idea that architecture retains a more direct relationship - the first drafts or sketches.

Today, we live in an era where computers and the means of communication are renewed in every moment and the means of representation are also subject of technological innovations. In this apparently one-way progress, this article intends to resume the discussion on the role of freehand drawing, especially the sketch.

The Drawing - a brief record

For some people the language, a system of signs which serves as a mean of ideas communication, has its origins in corporal gestures, from sound signs to graphics signs. The drawing is included in this last group. Every nation, every culture, in every age, supported by certain ideas, created its own way of translating the real world into a two- dimensional representation.

Architectural forms were, throughout history, challenges to engineers, designers and architects. During the Middle Ages, the two-dimensional drawings of large structures - bridges, fortress, churches - were often done on the construction sites, on the floor or walls. The drawings that combine plans, sections and facades, probably introduced in the sixteenth century,

are used even today to represent the spaces (REBELLO, ELOY and LEITE, 2006).

According to Righetto (undated), four important moments for architecture drawing can be distinguished: a) the Renaissance, where the perspective and drawing were used as a method of large buildings design, which were represented in sections and plans and supplemented with models, b) the eighteenth century, characterized by the introduction of the brush in the architectural drawings, by adopting the unit "meter" and the appearance of the orthogonal projections system by Gaspar Monge c) Modernism, the moment of separation between the "design implementation" and "presentation drawing", i.e., the technical design achieves a degree of abstraction and it is intended to carry out the architectonic object while the presentation drawing assumes a more freely character and d) the end of the twentieth century, a period when major changes occur in graphic expression systems through the use of the computer.

The sketch

According to Nascimento (2002), architecture is considered as an organization of space and it hasn't a necessary and predictable form, but it may be revealed through as many languages of architecture as the many individuals that projected themselves on it, i.e., the architect while conceiving does not adopt methods or codes, but he is fully immersed in his creative activity.

The freehand drawings produced during the project, are a sum of experimentations, perceptions and impressions. The draft, through its quick gestures, are able to capture the thought before its clearance, i.e., the thought flows out of mind, comes true, lies on the surface, and then begins to be read, analyzed, and modified.

> The drawing is a language, a way of expression, a way of thought transmission. The drawing, perpetuating the image of an object can be a document containing all the necessary elements to evoke the drawn object when it disappears. [...] The drawing allows the thoughts to be fully transmitted without interference from written or verbal explanations. It helps to crystallize, to take shape, to develop the thoughts. (Le CORBUSIER, 1968 apud BIRTH, 2002, p. 48).

For most architects, the sketches are part of a process where ideas move from the abstract to the concrete form, they are subject to changes, additions and subtractions. According to Rafael Perrone (in SCHENK, 2010), the design act is understood as a set of procedures used to describe a nonexistent object at the beginning of its process, and this process is carried out by successive approximations.

Although there are many alternatives in this procedure, this way of successive approximations has often begins on freehand drawings (sketches or preliminary studies) where forms are taking shape, developing to increasingly detailed drawings (blueprints), where the graphics and standardized systems represent forms perfectly defined. In this way, Perrone defines the first moment of the project as "suggestive representative drawings" and the second as "descriptive operative drawings".

A first reason that determines the impossibility of the elimination of the freehand drawing is because it is handmade and it is done quickly. The hand, through the sketch, can capture the unpredictability and discontinuity of thought. To Athur (in ROZESTRATEN, 2006):

> This is not a simple translation, exteriorization or materialization of a preexisting mental image. After all, the conception of a sensitive form could not precede its execution or construction, since the formative process is necessarily the genesis of its materiality. That is, the act of drawing or modeling is indistinguishable creation, so, it is open: open to criticism, review and modifications. (ROZESTRATEN, 2006, p. 1).

Among the works of architecture in Sao Paulo, Katinsky (in ARTIGAS, 1998) highlights the importance of the sketches of the Faculdade de Arquitetura e Urbanismo da Universidade de São Paulo, where "progressions, advances and setbacks, specific to a wandering through unknown territory can be verified." Katinsky considers that the draft is part of a creative process in constant transformation: "[...] man's creation is stimulated by it's own creations in search of perfection [...] it is creating that one learns how to create." (KATINSKY in ARTIGAS, 1998, p. 14).
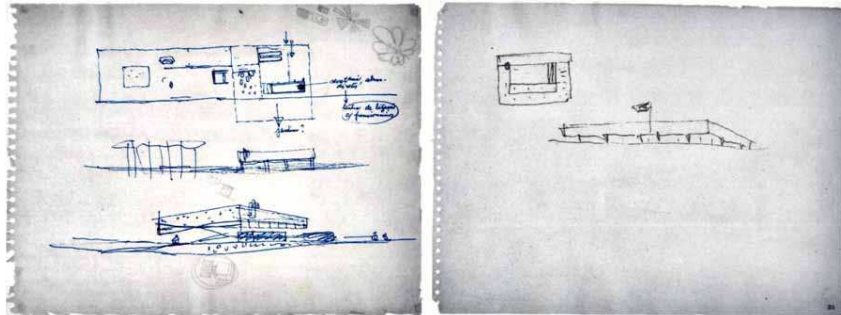
Picture 1: Vilanova Artigas FAUUSP Sketches. Source: ARTIGAS, 1988.

The Figure 1 refers to the Artigas sketches, Architect of the project of the Universidade de São Paulo. Artigas kept most of his sketches, which were

compiled into a book, where the history of the project through the drawings can be read.

> "The line, record of the gesture (...)" sets its route leaving evidence of its speed and its energy, showing the certainties and hesitations of the author. The line figures and materializes the gesture. It becomes drawing, when they adhere to the intentions. (DWORECKI, 1984 apud DWORECKI, 1998, p.115).

In the drawing field, in addition to the documentary function, the sketch is an important tool of interpretation, analysis and comprehension of certain works or elements, spaces and places. The graphical representation goes beyond the mere mechanical recording; it is the result of feelings, perceptions, and critical attention. The drawing may allow a more extensive and reflective comprehension over the territory, landscape, city and architecture.

The relationship between perception and drawing

The drawing is a way of expression and culture; it reflects the society and the urban space. To achieve this significance, before the gesture of drawing, there is a clearance, a perception of the object and individuals, their relationships, space, buildings and city.

In this context, the act of look is the initial process of the perception. It is not a simple look, but a closer look, a curious look, a gaze that seeks contradictions and stores information in the search for solutions.

To Bosi (in NOVAES, 1998) the eye is the open and movable frontier between the external world and the subject, both receive light stimuli and move in search of something that the subject will distinguish, will understand, will interpret and will think. There is a mere look, not the intentional act of looking and seeing as there is a result from an active look.

The architect realizes the built space either through architecture, or through the city. But what is the meaning of "perception"? Perception is not a faithful representation of reality. It happens when there is an interaction with the object, changing it. The perception is fed by the conditions of place and time. However, according to Merleau-Ponty (1994), the process of perception of the world happens from what psychologists call experience error, i.e., "one builds perception with the perceived". The issue leads to the replacement of the experience itself by the use of records of past experiences, leading to a lack of distinction and comprehension of the particularities of both new and passed experiences. (MERLEAU-PONTY, 1994, p. 25).

Vasconcelos (2006) considers perception as an effective way to learn and in this way, the drawing appears as a valuable tool to better understand the world and give it a personal meaning. Through the capacity of observation,

analysis, selection, comprehension, memory and trial, the drawing implements a perceptive consciousness.

This process begins by looking, passing through perception and creation and comes to an end in the representation. To Dworecki (1998) the representation occurs when the perceived, the consciousness of perceiving, the intentions and techniques, are added to the expression. It's like to use the traces of personality to make the drawing. The "expression" becomes "representation" in an act of synthesis. For the author, both "expression" and "representation" are facts of culture, things of the human being communication. "In the act of perceiving, feeling becomes itself emotion. Trace becomes drawing in the circumstance in which expression becomes always possible representation, unique and transformable". (DWORECKI, 1998, p.14).

The freehand drawing is unique not only for its unique and personal trace, but mainly by the perception that each one builds on its own mind.

Discipline of Architecture Drawing I

This article presents the methodology of two disciplines of Architecture – Architecture Drawing I and Project I, taught in the first year of the course. The goal of the Architectural Drawing Discipline is to introduce fundamentals of visual syntax and graphical expression as well as systems of spatial architecture representation. The classes focus on the perception and representation using freehand drawing.

> Drawing, drawing, drawing and drawing. Through choices, highlights and exclusions. Who draws learns and relearns how to see every day. The experience both in pedagogical level as the effective practice of the drawing, explains that one better observes, observing and one draws better, drawing. (TAVARES, 2009, p. 21).

Tavares's words represent the methodology adopted by the Discipline of Drawing I. Classes are filled by hard work, but gradual, freehand drawings, drawings from observation, blind drawings, so that the recent joined students master this language and can use it in the projective process. It is important that the student understand that the drawing is not just a manual process, but also intellectual and the practice will make him more able to incorporate the various factors that feed this process.

Students begin the course by establishing a better intimacy with the drawing paper, pencil, without the goal of a ready and final result. The program seeks to establish an increased development in the proposed exercises, ranging from body to body relationship in space coming to the built environment. (Figure 2).

Figure 2: students' sketches (Gabriela Villa and Pedro Ivo Teixeira) of the first year at the Instituto de Arquitetura e Urbanismo da USP, 2010. Source: class records.

Discipline of Project I

One of the Project exercise proposed in the first year was the establishment of a three-dimensional composition where the figures of circle and square would be present. The goal of this was to stimulate the students to confront these two figures in the exercise aimed to discuss the relationship between composition, representation and history.

The exercise plays with two major debates that occurred in the context of architecture in the sixteenth century. At that time, the theoretical foundations of the profession were being prepared, either in what it refers to the role of the architect or the close link between the professional that was about to be constituted and the two and three-dimensional representation. A representation of the architecture that was distinct from that used by painting and sculpture is now appearing as an intermediary moment between the idea and the construction site. The assignment of the architect as well as the principles of representation in architecture as it is known and still operates today - the understanding of the building by its section in parts (plan, section, elevation and perspective) - were being discussed. And the building with a central plan was constituted, at that moment, as the type that raised a debate among many architects. A broad debate, as shown by the large number of projects, which rises according to the suggestions that these forms proposed, the symbolic values they carried, but also the difficulties in paying off this encounter of forms and the necessity of representation and tensioning the rules. In the exercise it is important that the amplitude of the dimension of representation and composition be observed (Figures 3 to 5).
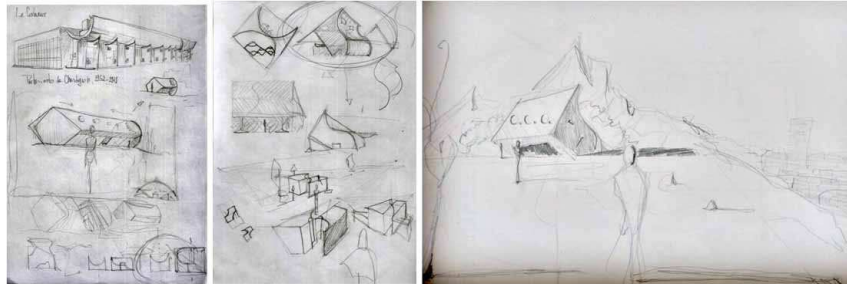
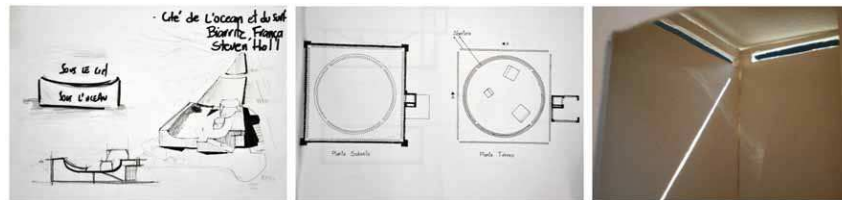Figure 3: student´s sketch and project exercise of Pedro Ivo Teixeira (1st year), 2010.

Figure 4: student´s sketch and project exercise of Murilo Silva Arruda (1st year), 2010.
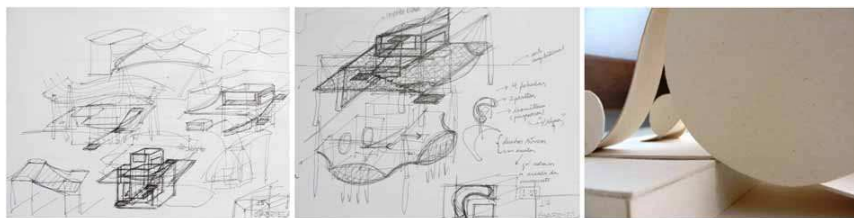

Figure 5: student´s sketches and project exercise of Gabriela Villa (1st. Year), 2010.

Complicity between drawing and design

The projective process can be briefly divided into three stages: 1st - the structuring of the problem; 2nd - the conception of the project and 3rd - the execution of the project. The first deals with data collection related to "existing problem" and its evaluation, whereas the second seeks to find the solution, the project development itself. This step is when the drawing gives its greatest contribution as an element of speculation in contrast with digital technologies that are used more often in the third step.

Maria Vasconcelos (2006) emphasizes the possibility of articulating different logics of thinking through the drawing, i.e., the fast movement in the same action allows the establishment of objective and linear relationships and the perception of them in an integrated and comprehensive way. To the author:

> It seems that "denseness" and "ambiguity" of freehand sketches allow multiple interpretations and identification of problems stimulating new design alternatives. There is a clarification of concepts through sketching in the ideation phase that by allowing an evaluation provokes the exploration of new ideas. (VASCONCELOS, 2006, p. 3)

New context

According to Duff (2005, in VASCONCELOS, 2006) it's not possible to think about the drawing today, in the same way as thirty years ago, because there is a new grammar and syntax created by new technologies. The activity of drawing is dynamic and reflects the context of its time. But it is emphasized that nowadays there is a coexistence of different technologies.

Differently from sketch, which allows an immediate interaction between author and project, digital programs, as the term implies itself, require a sequence of operations in executing the task of drawing. A new technique or technology does not replace another, but increases possibilities to work in an integrated manner.

New softwares such as CAD, Revit, Sketch-up, among others, are important tools and should be incorporated in the projective process. However, the connection between body, mind and expression is still provided by the analog process - the freehand drawing. Digital media may support and continue this first step, but the sketch is still an irreplaceable tool in the projective process.

It is clear the advance that CAD allowed to the field of architecture, it makes the projective process easier and reduces the execution time of a drawing, besides providing an unbeatable technical accuracy compared to freehand drawing. Some academicians and professionals argue that there are certain

limitations of the programs, as the impossibility of a global view of the project, which is conditioned by the size of the computer screen.

According to Righi (2008) studies suggest that during the process of parameterization of the solutions in CAD systems there is a digital simplification of the original proposal. Parts of the sketches imprecision studies, that allow the flexibility of the architect's actions, are lost. On the other hand, there are digital tools that assist in the projective process, such as the tablets. They allow the development of projects in teams; therefore, connected to a notebook and with the images projected on a screen, participants may draw, add and subtract ideas through changes in the designs interactively.

One of the advantages of drawing on a tablet is the possibility of storing the drawings and its subsequent edition by other software. The tablet is also presented as an instrument capable of establishing a link between the analog and digital. It is able to capture the speed and pressure applied by the stroke (digital pen) approximating the process of inserting data into the computer to the vagueness and ambiguity of the gesture itself of freehand drawing.

The Figure 6 shows three observation´s drawings: a hand and a copy of the Schiele´s drawing "The girl sitting", which were done using the digital screen and the last one, a building detail that was done with both the digital screen and the photoshop program.
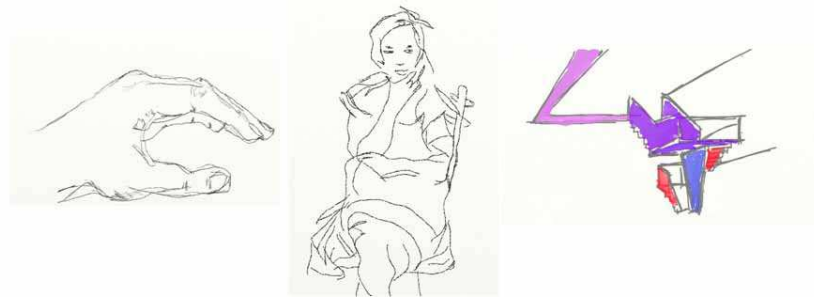

Figure 6: Gabriela Villa´s drawings, done using the tablet, 2011.

It is important to note that this is not a mere change of support, from paper to the screen of the tablet, but the possibility of a synergy between two logical spellings. So the process of systematization of the software itself can suffer interference by the immediacy of the freehand drawing, and it may have its reconstruction process significantly improved by the subsequent digital editions.

The Figure 7 illustrates a sketch done for the contest of the Confederação Nacional dos Municípios, in Brasilia, held in 2010, where the drawing was done on the tablet and then it was edited in photoshop program.
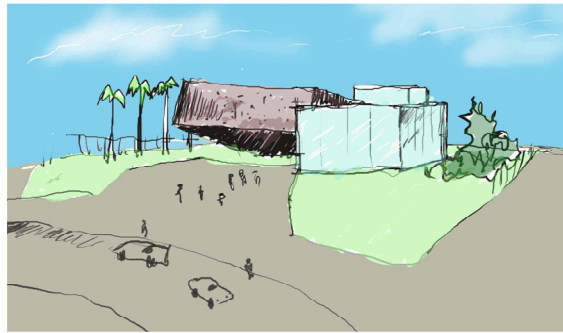

Figure 7: example of sketch done on tablet e edited by photoshop. Source: VIZIOLI, R., 2010.

Final considerations

Even with the technological transformations of the twentieth century, it would be naive to believe that the freehand drawing has no more use in the projective process. This is a moment of complementarities between the various techniques, the freehand drawings are still mandatory, but it is impossible to ignore the computational advances.

The drawing proposes possibilities that open up and allow a reading of the building from multiple viewpoints; it decomposes its compaction. Offering not only a shred of evidence, but many. The drawing becomes a sort of ground of conflict. And there lies its greatness and dignity.

Therefore, this impulsive drawing must be reintroduced and become part of teaching architecture. The sketch feeds the debate between the "thinking about space" and "spatialization of ideas", mainly through its characteristics of abstraction, vagueness and ambiguity. It sets itself up, as a character open to several possibilities for research and experimentation, taking important role in the process of solving problems.

Bibliography

ARTIGAS, João Batista Vilanova. **Caderno contendo o anteprojeto para a Faculdade de Arquitetura e Urbanismo da Universidade de São Paulo (croquis),** 1998.

DWORECKI, Silvio. **Em busca do traço perdido**. São Paulo: Scipione – Editora da Universidade de São Paulo, 1998.

MERLEAU-PONTY, Maurice. **Fenomenologia da percepção**. São Paulo: Martins Fontes, 1994.

MARIA VASCONCELOS, Helena Elias. **Questioning drawing for designers**: Project work as a strategy and examples from practice. In 2006 Designing Research Society. International Conference in Lisbon. IADE.

NASCIMENTO, Myrna de Arruda. **Arquiteturas do Pensamento**. Tese apresentada à Faculdade de Arquitetura e Urbanismo da Universidade de São Paulo para obtenção de título de Doutor. São Paulo: FAU-USP, 2002.

NOVAES, Adauto et al. **O olhar**. São Paulo: Companhia das Letras, 1998.

REBELLO, Yopanan; ELOY, Edison; LEITE, Maria Amélia D´Azevedo. A métrica da forma. In **Arquitetura e Urbanismo**, out, 2006.

RIGHI, T. A .F; Celani, G. Esboços na era digital: uma discussão sobre as mudanças na metodologia de projeto arquitetônico. Congresso Iberoamericano de gráfica digital SIGRADI. In **Anais**... Havana Cuba 2008.

RIGHETTO, A. V. D. A dinâmica do elaborar e do apresentar o projeto de arquitetura. Sigradi – Visualizacion en arquitectura y patrimônio, s/d. In **Anais**…p. 628-633.

ROZESTRATEN, Artur. O desenho, a modelagem e o diálogo in: **Arquitextos** (portal vitruvius) Texto Especial 392 – novembro 2006 disponível em: http://www.arquitextos.com.br/arquitextos/arq000/esp392.asp acesso 9/3/2010

SCHENK, Leandro Rodolfo. Os croquis na concepção arquitetônica. São Paulo: Annablume, 2010.

TAVARES, Paula. O desenho como ferramenta universal. O contributo do processo do desenho na metodologia projectual. In Revista de Estudos Politécnicos **Polytechnical Studies Review**, 2009, Vol VII, nº 12, 007-024.