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Teaching in megastore

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Abstract

The study investigates the role of drawing teaching of *Master of Science in Product Design and Boat* conducted at the Polytechnic School of the University of Genoa.
In particular, it aims to illustrate the training of the *Laboratory of Design* and sketch for the first year of studies and experiments that for some years has seen the University to collaborate with IKEA multinational company that provides the students their own exhibition spaces and their products to be the subject of study and drawing representation. The teaching of freehand drawing aims to develop the student's understanding of how to represent an object means to know, exploring the dimensional, qualitative, material and chromatic character.

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Keywords: drawing teaching; representation; megastore;

1. The Drawing Lab

The training that is offered by the courses to obtain a degree in Product and Nautical Design at the Polytechnic School at the University of Genoa has, as its objective, the training of "project technicians" able to operate with competence in all the execution phases of projects for industrial artifacts.

Upon completion of the course, degree-holders shall, in particular, be in possession of knowledge of a scientific, technologic, and humanistic nature, which is able to back up the diverse project specializations in the various course paths that have been taken. These can be related to "the design of the product", the "design of its communication/advertising", and "nautical design". In particular, as seen in the "Qualifying Training Objectives of

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the L-4 Industrial Design Class" it becomes evident how, for the students acquiring this degree – in a transverse manner to the training course path taken - *it is essential to have acquired the ability to visualize the project's idea in the diverse phases of the process: from the research and definition of the problem at the heart of the project, to the processing of the concept, all the way to the technical and working drawings used to put it into production. Therefore, the knowledge and the competences related to languages and artistic, visual, and representative culture, which allow for the elaboration of expressive modes and languages that are adequate to transmit the design idea, are of central importance.*

Consistently with the pursuing of these educational objectives, the Drawing Laboratory is a fundamental course to be taken during the first year of studies. It lasts a year and corresponds to 10 University Training Credits (CFU), which can imply 250 hours of individual study and exercises, on the part of the student, aimed at the learning of the program and therefore the passing of the final exam. The study program at the Laboratory is divided up into a series of ex cathedra lessons, which are followed by graphic exercises of an analogous type carried out by each student on an individual basis.

The professors to allow the student to become aware – in a critical sense – of his own studies route, punctually evaluate these targeted exercises, structured to verify the understanding of the notions acquired. The choice of integrally using analog drawing techniques derived from the necessity of having the student understand that drawing is – above all – an essential tool for understanding, which, in order to be adequately used, requires the knowledge of a very precise method. In the first, place the ability to *observe* is required, and therefore the need to train one's eye in the comprehending of the essential characteristics of any object. Next, one must *reason*, and therefore train the mind to attribute such characteristics to known geometric forms, to then understand which and how many are to be the characterizing signs to be used to transfer the thought onto paper.

This latter act must be born from the training of the hand, which must learn to use the instruments and the supports for drawing, thereby producing efficient signs, because one must even "persuade" in order to carry out correct communication. This instrument of understanding therefore sets the basis for all types of idea processes that the student has, because *(...) the first signs the pencil draws on a sheet are the traces of a thought being born, which the drawing transcribes as the first representative tracts of that which will take form in the mind* (Ruffilli, 2010).

The drawing of a reality today, as the first experience to arrive, therefore, at a drawing of one's own project, tomorrow.

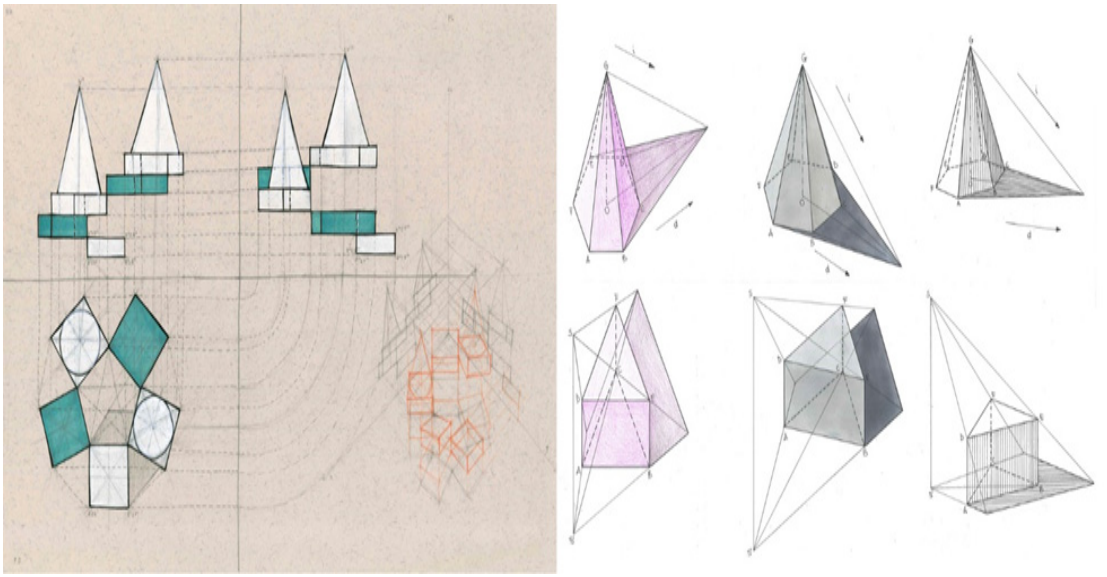

Fig. 1.Drawing representation of plane figures and of solid and composition of soli and studies of shadows. Students: (a) Beatrice Bianchetti (b) Sofia Aquila.

2. Analog Drawing as an instrument of knowledge

Fig. 2. (a) Verification of the effect of light on volumes in space (b) Synoptic table composed of orthogonal projections and 3D view. Students: (a) (b) Lamberto Anderloni (c) Beatrice Bianchetti.

The first part of the course tackles the teaching of Drawing from a semantic point of view. The drawing is, in fact, a universal language whose lexicon and whose syntax must be mastered by the student himself with the goal of producing an efficient form of communication. Therefore, the teaching path starts with the need of sensitively improving the student's manual skills, in order to give him greater expressive confidence in his own graphics.

His work must become, in fact, an immediate instrument to translate and communicate in an efficient way, his own design thoughts, be they still tied to the investigation of that which exists, be they the source of inspiration for the creations of new concepts.

Therefore, an illustration is given of the tools to be used (pencils, charcoal, pastels, pens, watercolors) and the supports that can be used for drawing and which are the first graphic exercises to be done to learn how to use these tools. A series of exercises is therefore assigned, to be done by free hand, relating to the graphic development of the background, shadowing, and texturing, based on hatching. These exercises allow the student to evaluate his own manual ability in the use of the above-mentioned instruments and to understand which ones, among these, are most harmonious with his way of expression, and which best reflect his own character. Once greater confidence has been acquired in the use of the "tools for design", the lessons then concentrate on the semantics of design, with the illustration of diverse systems of representation and their respective graphic norms, through a series of seminars on projective geometry. Drawing means to carry out, in fact, a double operation of projection and selection, through which it is possible to transfer the image of a tridimensional object onto a two-dimensional plane. The nature of this projection – cylindrical or conic – allows for the obtaining, respectively, of orthogonal projections, axonometric (isometric) projections, and perspective projections. The graphic exercises related to this part of the program are always those of an analog type, and foresee the use of the instruments stated as follows for technical drawings: rulers, set squares and compasses.

The exercises first of all look at the representation of the fundamental elements of drawing (points, lines, and planes), to later address the representation of plane figures and of solids – and compositions of solids – that are lying on the three fundamental planes (the horizontal, the vertical, and the lateral) which are perpendicular to each other, as well as to the planes that are generically placed in space. These exercises are educational for the elaboration and resolution of the most complex problems, tied to the representation of the intersection of solids variously placed, whose comprehension and capacity for resolution offer the student the method and the capability to handle, in a later moment, the representation of any type of industrial product.

Having acquired the notions related to geometric drawings, it becomes essential to have the student do exercises in the understanding of the forms of the objects that surround him, to be able – in a process of synthesis – to transform any item into a noted form (plane or solid) and thereby make it easily rendered. Several drawing exercises of real

items are therefore proposed, in which the requirement is to redraw design objects using freehand drawing. *The procedure for the carrying out of a drawing from a real item, cannot be shown schematically, as often its implementation is tied to the person who is carrying it out. Generally speaking, we can identify three distinct preparatory levels for the execution of a drawing: seeing, comprehending, and synthesizing. Teaching how to see is not easy, because one must remove a series of psychological conditions and above all be in command of the projection process, which allows for the passing, through an operation of projection and sectioning, of space onto a plane ... The mental process of understanding pushes the perception organs into evaluating the relationships between the various parts which make up the object, to identify its structure and its formal qualities. ... In this phase, we also select those elements, which have a strategic value to identify the object that is to be depicted .... The understanding of the hierarchy of values allows for the passing to real drawing, which is always an operation of synthesis, as it in itself is represented only by a part of the elements, which make up the object.* (Docci, 2002).

Freehand drawing helps develop in the student a comprehension that how *to represent* means *to understand* an object, exploring its dimensional, qualitative, material, and chromatic character.

The fundamental passages for the creation of a hatched drawing to induce understanding is, therefore, the reading of the proportions, which underlay the forms and the ability to reproduce such forms passing from a tri-dimensional view to its representation in a two-dimensional plane. The choice of the method for representation to be used will privilege, from time to time, the descriptive aspect of the single components of the object (orthogonal projections), the system of the assembly of these (isometric projections), and the realistic perception of the object in space (perspective projections). *In addition to being an indispensible form of communication, the drawing is - in fact – a tool for comprehension and for ideas ... The drawing allows, first of all, for the understanding of the real nature of an object or a manufactured artifact: the object is disassembled, all its components sectioned, analyzed, studied, and therefore fully understood.* (Cecconello, 2009*).*

Particular attention is given to the elaboration of synoptic tables composed of orthogonal projections and exploded isometrics and/or broken isometrics. The choice of showing on the same sheet a two-dimensional (orthogonal projection) and the three-dimensional view which are not altered neither in the dimensional relationships nor in the degrees of the angles of the objects that are analyzed (isometric projection), allows in fact students to represent and comprehend the spatial combination of the planes of reference (the horizontal, vertical, and lateral planes) and to better handle, in future, the orientation of the UCS (User Coordinate System, the UCS icon visualizes the orientation of the system of coordinates users of tridimensional space), whenever they will use the program for digital design. Greater skills in handling three-dimensional space and the correct layout of the parts that constitute an object are in fact the necessary condition for the handling of any type of idea process. *Let us remember in fact that in philosophical discussions, where the act of representing happens to coincide with that of knowing and of thinking, the representation – in that it is a conscious act – assumes over time different meanings which – simplifying greatly – end up taking us, on the one hand, to an automatic mode of the internalization of objective data and of their reproduction of signs, and on the other, to a process of international character, creative thought-action tending to the externalization of the idea* (Bistagnino, 2010).

3. The Drawing of Material and of Color

To acquire expressive and appropriate ability in the field of the representation of objects, it is not possible to do without the study and the understanding of what graphic techniques are the most efficient in the realistic representation of their material and color components: … *to identify and render in the layout those which are, from an optical point of view, the main qualities of a given material, that is the characteristics which make it recognizable at first sight. To this end the element that must be most kept in consideration is the light-material relationship. Before passing to depiction, it is necessary to understand if the material absorbs or reflects light and the type of chiaroscuro produced* (Verucchi, 1987). The natural evolution of the expertise acquired through the drawing of isometrics and perspectives is, in fact, the ability to redirect drawings in which one takes account – not just in intuitive terms but also with the correct geometrical handling of the forms – of the verification of the effect of light on volumes in space. The second part of the course deals, therefore, with the teaching of the theory of shadows:

Geometrical studies, which allow, once the light source has been set, for the construction through a series of geometrical graphic operations of the movement of the shadows themselves and of those created by a determinate object (Docci, 2002).

Fig. 3. The advertising: (a) the original, (b) studies (c) photo-realistic render. Student: Sofia Aquila.

The practical exercises regard the representation in isometrics and perspectives, first of compositions of regular solids, and then of those of objects which are of a more complex design.

The student trains his own graphic ability, not just seeking to resolve real design exercises, but also by copying some drawings of particular interest: the advertising. This exercise requires the student to reproduce a three-dimensional form, which, however, is represented on a two-dimensional surface thanks to the technique of photography. Therefore, the purpose here is to make a drawing that is defined as photo-realistic by using the representational technique of analog drawing. The instruments proposed are therefore mainly felt pen markers, which offer an ample range of colors and allow for a rapid application adding interesting immediate graphic effects. The felt pen markers, with tips of differing thicknesses, allow in addition for an ever more precise definition of the object depicted. This technique offers notable results when used in drawings with mixed techniques as the marker can be easily enriched, in fact, by the use of additional instruments to depict with more contrast – and therefore with greater efficiency – the zones of light, be it diffused or incidental, semi-darkness, shadow sides, or cast shadows.

The following instruments can be used in this sense: colored pencils, white pencil, colored chalks, white chalk, white ink pens, and felt pens of diverse thicknesses. The drawings requested of the students need therefore to be related to all the themes that are contained in the copying exercise of a graphic communication such as an ad, studying separately its components: drawings (forms and colors), words (lettering), and the corresponding graphic signs (Falcidieno, 2006). In particular, concerning lettering, the typical fonts used must be studied geometrically and

reproduced. In addition, evaluation must be done of the possibility of synthesizing these letters with a box of equivalent dimensions. Concerning the graphic signs, they must be positioned correctly in the setting of the composition.

Concerning the background, various tests of the final product must be done with differing techniques in order to evaluate which one is most similar to the original. These range from the use of colored paperboard to the use of an airbrush. The study of the object to be depicted requires obviously a greater number of drawings: the form of the object must be correctly reproduced – translating the photographic image into a perspective view, showing the material of which it is made and its chromatic components, in addition to the all the effects of the interaction of the object with light. Extremely interesting are the cases, for example, of glass objects with metallic components, or the reproduction of textiles and leather characterized by a particular weave.

4. The Workshop in the Megastore

The Drawing Lab also has a final exam, which is the moment to verify the knowledge acquired en route by each student. At the end of the year, therefore, required as a "written exam" is the drawing up of a graphic exercise which contains a sort of synthesis both of what has been transmitted as the study program as of the exercise carried out up till that moment. This drawing exercise is structured as the graphic tale of a design object which is to be communicated, both in a two-dimensional as in a three-dimensional manner, through visual proportions, without the support of setsquares and rulers, but simply by freehand. It is also requested that the perspective depiction be rendered, that is, given the graphic information, which aims to reproduce both the material of which the object in question is composed, as its chromatic components.

Starting from the 2009/2010 academic year, up to this present academic year, and thanks to a Convention Framework that has been stipulated with the Department of Science for Architecture at the University of Genoa, the company called IKEA which has a branch in our city, has placed at the disposal of the Drawing Lab its own exhibition spaces with the purpose of offering the students the possibility to observe, draw, and tell about the objects that it produces. During these five years of work, approximately 800 students have had this experience and, obvious, done an equal amount of drawings.

The final workshop is organized for two days of work, one introductory to the other. On the first day, the students choose a design object of a moderate size to bring to the university hall, and there they make, during a day of study, a drawing of this object, synthesizing on one sheet, which is to be handed in at the end of the day. This is the preliminary test before they exercise their skills at IKEA. This first exercise allows them to calibrate the time that they have at their disposal in relation to the three drawings required: an orthogonal projection, a freehand rendering on a perspective depiction, and the reproduction of the lettering of the brand of the company that makes the object that they have chosen. The students have to design the layout of the sheet requested while keeping in mind, in their graphic composition, the general criteria of perception and communication: the existence of an invisible grid of reference and relative alignments, legibility and the evaluation of the different visual weights of each component, and graphic coherence between the drawings proposed. This passage is considered fundamental in the educational program of the lab because … *the knowledge* [of the student] *indicates his skills and abilities with respect to the instruments and the contents. These need to serve as the basis of the design of a communication. Such knowledge allows, in fact, for the avoidance of ambiguities, incomprehension, or even errors, because it allows the selecting of the best elements with respect to the final* [communicative] *end to be reached* (Falcidieno, 2009).

The corrections and the related notes on this first drawing allow the students to critically evaluate their own work before carrying out the real exercise of the exam, which deals with IKEA products. In preparation for this exam, the students are invited to carry out a site survey at the exhibition space of the company and there they are oriented, in their choice of the object that they will depict, towards interior design accessories of medium size, which are not monolithic, but which can be disassembled, to analyze each single part which makes it up and the consequent assembly system. The key moment at the workshop is the day in which the students are hosted by IKEA and do their written exam by the use of a freehand ex-tempore drawing. The students spread out along IKEA's exhibition route and draw a real object, which is on exhibition, chosen in accordance with their teachers. This type of practical exercise is carried out in a new setting for the student, who is used to drawing in the classroom. A situation of unease is caused by the lack of tables and chairs on which to work, the confusion of the sales environment with its flow of visitors, and the fact that it is impossible to isolate the object that was chosen from its own exhibition context. All the same, and in spite of the problems, the students show (and above all see it themselves) that they

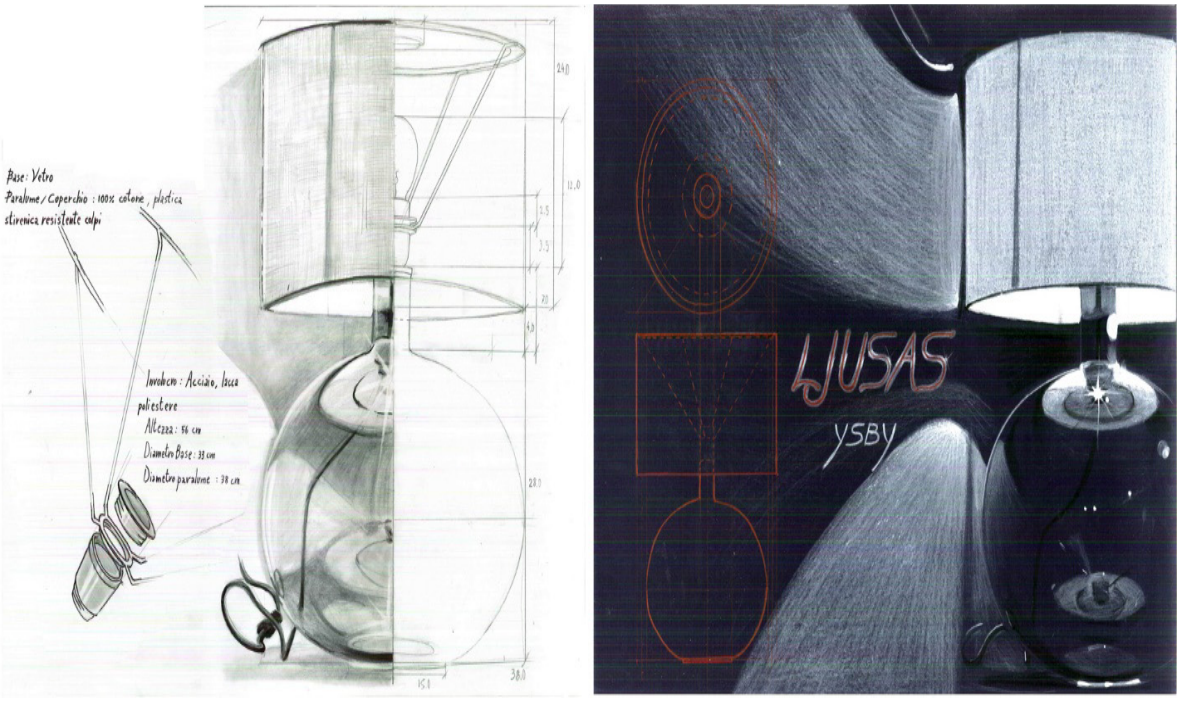

Fig. 4. Workshop at the IKEA: (a) studies; (b) freehand ex-tempore drawing. Student: Giangiacomo Guida.

have matured during the course of the Lab, acquiring a greater feel for drawing, a greater self-confidence both in the handling of the instruments as in the management of time for the execution of the various depictions along with a new expressive maturity with regards to their own graphics, such that they can overcome these difficulties with new concentration and greater attention.

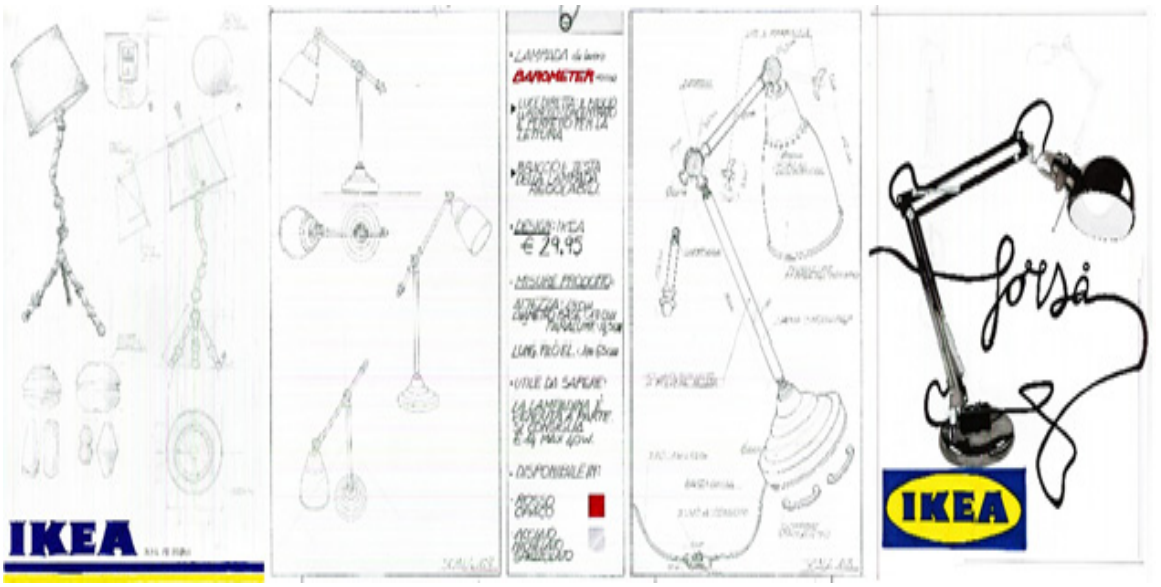

Fig. 5. Workshop at the IKEA. Students: (a) Andrea Sancasciani (b) Barbara Molinelli (c) Marco Repetto.

Fig. 6. Workshop at the IKEA. Students: (a) Beatrice Gobbo (b) (c) Sara Balbi

This is surely a prime result that is very interesting in the course of work studies carried out in the classroom during the months of the Lab. Obviously the most important results are given by the quality of the drawings done during the six hours of work at the workshop and, in particular, the critical ability of the student to choose an object which responds to the requisites requested and the ability to design a layout before starting to draw, and therefore to acquire self-confidence and knowledge with respect to paper space which is at his disposal, and the communicative aspect of the drawing. The graphic maturity acquired in learning the "language" of drawing is therefore verified by the student himself, before even being seen by the professor, for his own ability to methodologically face the problem proposed with the application of the techniques of drawing which are considered to be the most expressive and pertinent to the expression of the material and chromatic characteristics of the object chosen.

Fig. 7. Workshop at the IKEA. Students: (a) Marta Bianchi (b) Francesca Comparato (c) Valentina Bresciano.

This knowledge is the true essence of design: being able to graphically communicate a project in a punctual and efficient way, both with respect to the communication of the existing, as the fruit of an ex novo design. IKEA

renews each year with pleasure and enthusiasm this challenge (which is also numerical) of welcoming the students into its own exhibition space, without altering the normal flow of visitors/buyers, and it does this because it has verified the enthusiasm, knowledge and professionalism with which the students face this final test. Moreover, this moment of meeting has generated, in the past and we hope in the future, opportunities for work contacts between the company and the students, offering the most worthy the possibility of an active internship for their professional training.

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