DIGITAL MEDIA

Its incorporation into the education of architects and graphic designers

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Abstract. Here we introduce a pedagogic experience in the Universidad Nacional del Litoral, Santa Fe, Argentina. It has begun about ten years ago, with the first intents of incorporating the computer into the design and teaching process, until current days with the setting of a Class for Introduction to Digital Media (IMD), as an obligatory subject in the first course of careers such as Architecture and Urbanism (AU) and Graphic Design of Visual Communication (DGCV). The introduction of “Computing Science” in this university resembled the process of other Universities (Pentillà Hannu, 2001). Today we can see that this was not adjusted to the necessities of these professions neither in the educational process nor in the professional production. In our case we will address particular experiences that enabled us to evolve in a pedagogic model towards the concept of Digital Media (DM) that we currently practice.

1. The initial conditions.

From the inauguration of a Computer Science and Design Centre (CID) carrying out courses, workshops and seminars which covered the basic use of software and hardware, up to the most relevant concept based workshops brang with the collaboration of local and foreign professors. Just to mention some of them: Digital Workshop “Design of Architectural Experiences” - Bermudez (1995), Program for Education of Teachers and Students of the CID. - Stipech (1996 - 97), “Analog-Digital Workshop” (Bermudez 1997), Course “Re –Presentations: Media Queries of Architecture” (Hermanson 1998), “Analog-Digital Design” Post Graduate Career (Stipech 1999), Research Project “CAI+D 2000, Design in the Analogue – Digital Media Program”, “Digital Media and New Technologies Workshop” for Licenciate in Visual Arts, Stipech (2000). This process was also influenced by the International Program of Academic Exchange with the University of Utah, (IPAE 1995) that offered significant and wider vision of the international context to students and professors. Another definitive contribution was and
is the participation of diverse professors and students at the Ibero-American Society of Digital Graph, (SIGraDi), since its establishment in 1997.

1.1. THE COUNTRY AND THE UNIVERSITIES

In our country the Public University is characterized by being free and having an unrestricted access, as a result it has a massive number of students. Resources and infrastructures are completely insufficient not to mention the dependence on latest generation technologies at this field of knowledge, among other general and particular problems of under-developed countries, also euphemistically called countries of “emergent economies”. Regarding this brief description, it would almost be paradoxical to think and to work counting on the inclusion of the new technologies. Still, we try it to elevate our perspective above and beyond the turbulence and commit ourselves in an enterprise for a different future, focusing on the education of professionals that within eight years will be in full occupation, demonstrating the hypothesis that the “future” will not wait for us just because of the particular situation of this country.

This year adds a new challenge, to migrate all the university’s software to open or free code systems, due to the impossibility of maintaining and upgrading the equipment and the software's licenses. This is going to a hard task, since the students habitually operate only the registered brands' software and, in their majority, they are immerse in the frantic race for updating and getting the latest novelties of the market. These novelties are, in many cases, unnecessary given they only add a more attractive display, except for those cases in which the interface really generates better possibilities in the prosecution of effective and improved Digital Media performances, resulting in a contribution to the knowledge construction process.

1.2. THE CURRICULAR REFORMATION

In the year 2000 our university formulated a deep reformation of the course contents, when the so called “sub-zero computing”, in reference to the basics of computing, was included as an obligatory course in all careers, integrating common areas between them, in our case AU and DGCV. This allowed elaborating the contents for the course (IMD) focused on these disciplines related to inventiveness and communication, providing a positive boost by giving up the direct pragmatic and concrete urgency on the use of software and applications. In order to focus the DM from a wider spectrum e.g. the influence in the thinking and the perception as a phenomenon of this age
2. The Course (IMD)

The global idea is part of the results of the research project involved in the CAI+D 2000 Program: "The Design in the Analogic-Digital Media", which provided, among other elements, a clear diagnose about the education and skills of the entering college students, and the necessary knowledge requirements for the university level in these disciplines. This education can be reinforced with elective DM specialisation courses, on each individual discipline, which must approach its different objects of knowledge more specifically and deeply. The students may continue their career seeking to major in a stated field, or to master a technologic performance, or to enter an experimental and research phase. Simultaneously, the intermediate degrees included in this plan will give rise to other specialisations like “Digitizers”, “Network Managers” or “Digital Resources Managers”. This specialisation, being aimed to achieve the greatest advantage of the available technology (specially regarding the context limitations), must also be complemented with a thorough disciplinary knowledge and a critical vision on the future developments.

3. Contents

3.1. GENERAL CULTURE

A number of knowledges about DM are introduced, mostly focusing on Digital Graphic, starting from a critical analysis of the digital world and its emergent cultural paradigms. There is a permanent confrontation between the achievements in the conceptual and critical queries in contrast with the unconditional support to technological novelties. It is also necessary to mention that many students have access to a PC only through the Faculty facilities, or renting a PC with internet access in a cyber-cafe or in public phone office. Other students have their own PCs but, in many cases, they are not latest generation equipments. These points consolidate the idea of prioritizing the creativity in the conceptual plane as much as in the practical skills, exploring the resources of programs that have not been exploited in their maximum potential.
3.2. FORM GENERATION

In spite of the remarkable difference between AU and DGCV’s methods and procedures to generate its ideas pre-figurations, in an introductory level there could be several topics related to the Media Culture, mainly related to the perceptive field of new digital forms, which have an influence in the conceptualisation of the past, the present and the future. This can lead to differentiate three topics:

A physical world insight: we start from the acceptance of the existence of digital space (cyberspace) as an entity, in addition to the assumption that digital media and the telematic nets represent and manipulate the material world. This causes important changes in the perception of the physical world (material, analogic) as well as in the perception of the new virtual phenomenon (digital, electronic).

The positions on these topics extend, among multiple conceptions, from the extremes of regarding them as parallel realities, with different hybridization degrees, up to consider them integrated or unified.

We believe that the students should approach the different opinions from their personal situation and obviously from their general ideology. Therefore we foster the reflection and enlarge the spectrum through examples of different Media sources (Internet-CD-video-cinema-TV) which, combined with the bibliography (see References), communicates and shows different conceptions, many of them critically opposite. Avoiding unilateral explanations paves the way for the elaboration of the students' personal postures.

Transpositions and Hybridations (Neiman & Bermúdez, 1997), the changes that the physical world experiences with the empowering of the perceptive and cognition processes through the MD projects us to... the post-biological faculty of cyberception"... (Ascott, 1995). In relation to this we attempt a new vision through the migrations among media as a pedagogic practice. As an example there is an exercise that starts from the analogic capture of real objects, which then must be digitized applying collection and selection criteria. Then they are digitally manipulated (cutting - pasting, processing and retouching, applying transparency - overlapping, expressly avoiding the plain and direct use of filters and transformations of the involved software).
Fig. 1a – Left: real spaces or figurative resources. Right: the resulting spaces. These works were presented in portable files (CD support), with an explicit structure of directories according to the number of stages, processes and transformations. The final presentation were in the format of web pages or digital slides that included animations, music, video, etc. Students in order of appearance: Bernardini, Romina; Elias, Juan; Franco, Matías; Godoy, Fernando; Lemaire, Mauro.
Fig. 1b – Left: the real spaces or figurative resources. Right: the resulting spaces.
Students in order of appearance: Morante Lucia; Núñez, Juan; Reinante, Milagros; Rodríguez, María; Tournour María.
The exploration of these images determined the discovery or the deliberate composition of one or several space forms that will be prepared for its compression and communication through objects or elements of figurative treatments. The resultant digital object or space should be described by means of a sequence, or a script, that intertwines the images or explores them internally. In brief, alternative readings are looked for, to challenge the traditional syntax of material objects and to learn how to see the digital space and forms. The process is conducted from the perceptive field to the conceptual field, with predominance of action over speculation. The discovery and construction in digital space forms, from the original flat images of real objects, is only possible by the promotion of a vision that transcends the apparent quality of things, looking their underlying structure, breaking the conventional readings, the sense of reality and of the possibility. Searching, valuing and confronting the physical with the imagination by means of metaphors, figurative meanings, metonymy -taking the effect for the cause or vice versa -; comparisons will be worth, as well as fusions, analogies, confrontations, associations, parallelism, etc. To sum up, a necessary attitude of absolute opening and creativity for these disciplines.

Cyber space, aesthetics and valuation:

Fig. 2 - Analogies on the articulations of the vertebrates. Captures, processing and final presentation with hyperlinks. Student: Meza Walter.

The migration processes that embrace the transformations from materiality to virtuality produce, to some extent, digital objects that can become
independent of their past condition, making necessary to understand them under new parameters. It is not appropriate to value those objects or digital spaces with the classic laws and syntax of the physical world. As theoretical background we lean on diverse essays and experiences: e.g. (Anders 1999, Kolarevik 2000, Novack 2001, Senegala 2001, among others) that contribute the first steps in the conceptual definitions and the first "words" that allow thinking and describing the digital form.

![Fig. 3](image1) Fig. 3 - Migration and construction of imaginary spaces with a script that appeals to some figurative objects in its meanings. Interactive and animated presentation. Student: Gorriti Verónica.

![Fig. 4](image2) Fig. 4 - Illustration of a text through the migration and interpretation of explored and published real images. Student: Ibarlin Patricio.
4. Implementation, edition and production

Instrumentallity as part of the communication strategy for both disciplines is outlined in three levels according to the purpose of the digital production:

Generation and management of the digital information. (Bonsiepe Gui, 1998): The separation from systematic aspects is a usual practice in creative disciplines, but this practice is very unsafe in the digital media, besides to avoiding the production of non appropriate files sizes and formats, systematisation constitutes a central topic. We intend to compare it with the design of an efficient information structure, bound to methods and routines. Generating digital spaces consists also about making sustainable the system that supports them. Apart from the dangerous volatility of the product, the dependence on the fatality of the yes-no / on-off of the binary system there is the question of ... "how we approach the handling of virtualised matter, how we apprehend the here and now"... (Bermúdez 2002).

At first, this seems a relativistic topic but, we consider that, for an efficient formation in the DM, a basic administration of information constitutes a "design" action, a part of the interface and of the very same digital space structure. We call "design" the fact of arranging a net or a sequential organization that responds to an idea, which maps and nodes represent and advance the way synthetic information is going to be experienced: it is a fundamental part in the digital forms, perceived in a different code. This structure can reach the same conceptual or expressive meaning as a "sketch" or a scale model have in the analogic media. These communication strategies are carefully minded when comes the time to design a final presentation or an interactive communication. But on the other hand if they are thought and integrated from the start in the design process, they become a conceptual tool that feedbacks the whole process, apart from ensuring the backup and retrievability of information.
The material and digital support of information: From the beginning of the information management, peripherals and nets, which are the ones that determine the perceptible formats, are integrated. By then there is the awareness that this resembles the management of data flows which acquire diverse characteristics according to the direction and sense we give them. It is also very relevant to know from the first stages of digital production what is going to be the final support of what, otherwise, resides only in the PC’s screen and memory, in order to achieve a successful output. Although everything is versatile and transformable, the fact of foreseeing the final format saves time and effort. The class practical works propose to pass through three instances, modeling information within basic formats in order to: 1) send it or to publish it in the Internet, 2) translate it to a material support (prints in our case) and 3) copy it in portable digital supports. Each of these implies different procedures and the use of specific software for optimum results.

![Fig. 6 – Material supports designed by the students, leaflets, posters, cases, covers and labels with the contents of the digital production](image)

Research and experimentation of digital forms: After studying the digital form generation through analogic-digital migrations we can mention the form generation within digital environments, in this case it is necessary to investigate on software that allow automatic, manual, or combined model generations.

Because of the short available time during the course and the amplitude of the topic, there is only the chance for a brief demonstration of the numerous digital resources e.g.: modelling and edition of primitives, generative geometries, NURBS, fractals, data visualisation, etc. just to count some of the sources for synthetic form generation. This way the students approach a prospect of the necessary instruments and techniques for higher courses or self-managed investigations. Through the learned and experienced concepts and in other stages students can attempt the understanding, practice and valuation, or a criticist vision in the processes and the resulting forms.
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Another aspect that is approached in this part is the integration and experimentation of resources and complementary knowledge that will be later on an Interdisciplinary work (computer science, cinema, photographs, sound, communication), as the parts that constitute the incipient discipline of the Digital Graph. It is looked for to understand the interdependence that leads to the Inter it disciplines, since it is difficult to gather them with depth and effectiveness in a single person or profession.

Fig. 7 - Text interpretation and transposition: script assembly.: The chair IMD research team, Arch. Guillermo Mantaras

Fig. 8 – Generation and migration digital-anologic.: The chair IMD research team, Arch. Thomas Morahan

5. Working methods

The course which, just to give an idea of its massive characteristic counted with 513 students during 2002, was divided in commissions of regular and free students.

There is also the possibility of studying at distance for the Bachelor’s degree in DGCV and other technicatures by means of satellite classrooms. This system is available in forty towns of five argentine provinces.

There is a physical classroom, a virtual classroom, an internet site and e-mail connection, a set of tutorials, printed and digital publications, reading references, and practical guidance lessons.
During 2003 some courses will introduce this experience on the interactive Campus or university’s educational intranet which will optimise the communication started at the site www.fadu.unl.edu.ar/imd This will add interest on the remote management of non presential systems with the incorporation of forums, chat and videoconference rooms.

6. Conclusions

1 - The results of the pedagogic experience show a high promotion level and an important acceptance of the teaching system. It is also possible to appreciate very good design and communication performances, and complex thinking operations reinforced by the creative use of software.

2 - The final practical works synthesized the thematic axes of the course like: the generation of digital information, hybridation, migration and manipulation of real and virtual forms. It these exercises there is a remarkable change of the perceptive dimension, and an assimilation of new visual language elements.

3 - the DM facilitated the graphic conversions and transformations, with the generation of new forms impossible to carry out by other representation means, which opened new interpretation or re-signification possibilities.

4 - Part of the production remained within a standard and conventional frame, (relatively expectable regarding this is freshmen’s first approach to these topics). On these cases, there are certain achievements on the use of basic software, but a clear lack of visual education evidenced by the use of naif graphic resources and the extensive use of built-in library objects, clips and images available in the used software. These difficulties are related to a deficient pre-university and general culture education.
5 - Likewise, the bibliography and the theoretical contents were superficially approached without further criticist reflexions, nor inventiveness; lacking conceptual and ideological density. This is a complex situation and exceeds the class resources, but from this course there is an attempt to generate the necessity to elaborate concepts simultaneously to the development of perceptive aspects and of a pertinent language for Digital Media.

6 - In both extremes, the students who transfer what they know about the traditional culture, as well as those who try to discover and to operate within the digital culture, we notice they bring some common preexistent image, time and movement culture (though it can seem intuitive at first), but it comes from the experience of TV and the entertainment media, both currently saturated by the internet aesthetics.

7 - Synthesising, all these pedagogic practices are absolutely experimental and they are under permanent revision and change, but we have arrived at two precisions: Independently of the exercise type, we will continue approaching the Digital Media field related to our
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References


IMD the chair is composed of interdisciplinary educational team: Andrea De Monte, Georgina Bredanini, Guillermo Mantaras, Mauro Chiarella, Rodrigo Agostini, Thomas Morahan, Architect’s; Martín Marguello, Graphic Designer, Daniel Mendoza, Analyst of Computer Science.

IPAE - International Program Academic Change, Director’s: Prof. Julio Arroyo FADU. UNL. Argentina and Prof. Julio Bermúdez, Utah University. US. This program to the date it already developed 20 projects, that involve 39 student’s, professor’s and authorities.


