# AN APPROACH TO DIGITAL TECHNOLOGY INTEGRATION IN ARCHITECTURAL CURRICULUM AND STUDIO

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**ABSTRACT**
As a profession and as a discipline, architecture is at a crossroads in the digital age. Academic institutions have been faced with the question of how to integrate digital technology into their curricula. Changes of information, relation, and context over time are perceived as processes. To enable and combine these aspects in a digital environment is the main task for the information. Communication can be useful for requesting information. There are different challenges when trying to enhance communication in digital environments. The different design stages help to integrate communication effectively into an environment and a collaborative process.

**Keywords**
Digital technology, curriculum. architectural studio, Collaborative Design.

## THE MEANING OF DIGITAL TECHNOLOGY AND ARCHITECTURAL CURRICULUM

Design and technology in education is essentially a practical process which involves having ideas and then purposefully and thoughtfully engaging in designing and making activities leading to the creation of a building. The process of education through which the students pass is very important in terms of:

- The teaching which it demands;
- The various forms of learning which can take place; and
- The through assessments which need to be carried out.

Today a new demand for computers and architecture has been established. It can be viewed from two main points of view: the inclusion of the dimensions of time and behavior into the design conception and creation of places to be navigated within the computer. In completely different ways, these two kinds of association between computers and architecture are entirely related to the social dimension of space, be it physical or digital [1]. The creation of places to be navigated within the computer has not often been considered as an architectural task. Most of the web designers are programmers or people involved with communication, without any background in the creation of "places". It has become very common to find the three-dimensional worlds of the internet bearing a remarkable resemblance to physical space.

In this paper, usual approach to the integration of the computers into the architectural curriculum has been to integrate the computers into the curriculum or studio. As a profession and a discipline, architecture is at a crossroads in the digital age. Academic institutions have been faced with the question of how to integrate digital technology into their curricula and pedagogy. Changes of information, relation, and context over time are perceived as processes. To enable and combine these aspects in a digital environment is the main task for the information. Communication can be useful for requesting information. There are different challenges when trying to enhance communication in digital environments. The different design stages help to integrate communication effectively into an environment and a collaborative process – see figure 1.

Design and technology does not have an empirical body of knowledge from other curriculum areas, notably science, but also maths and art. However, when knowledge gained in these areas is applied in design and technology it is far more likely that, through its use in relevant, purposeful and practical activities, knowledge will be converted into true understanding [2]. The most important and most elusive aspect of progression in digital technology and design concerns the issue of capability. Capability involves something far more difficult to define than knowledge and skills. It is an application of these, combined with higher-order skills and attitudes, which constitutes real capability in digital technology and design.

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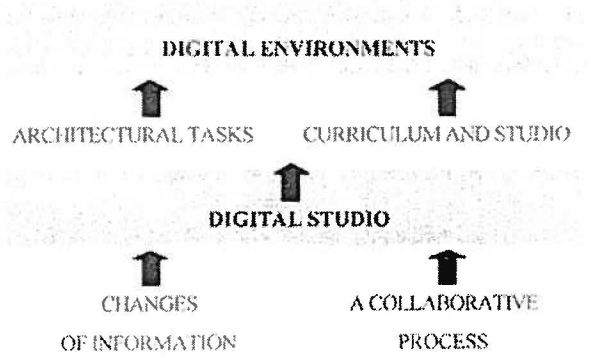
Figure 1. Intentional model of Multi-actor curriculum use in architectural design studio.




In preparing for inspection, curriculum co- ordinators need to be clear about their role in the following areas:

- Defining the school's purpose/ recognizing strengths and successes;
- Defining your role in the management of the curriculum area;
- Your part in whole school management and development;
- Preparing the documentation;
- Preparing for the discussions with the inspectors;
- Receiving and interpreting feedback.

## PROCESS AND COLLABORATION

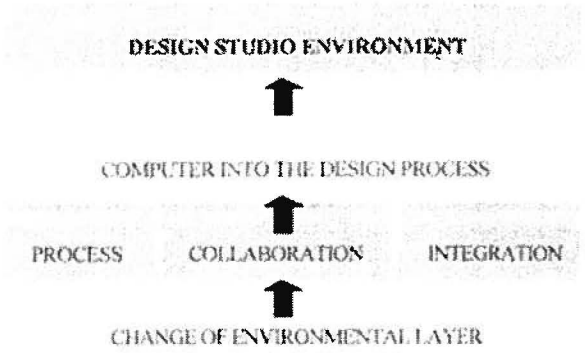
Process refers to the capacity to create, update and modify design, i.e. drawings, models or sketches. In a broader sense, process is the capacity to work with the information during the design studio, not only to elaborate information, but also to communicate and share it [3]. In the studio information flows are both a structured and a loosely structured process. The revision process is a structured process, with its distinct steps of presentation of the work, critique and discussion.

The successful interaction between student and instructor relies on collaboration during which principles, values and issues. Students do not make an explicit distinction between working cooperatively or individually. In the future we will continue to focus on creative collaboration and machine intelligence, better user- interface design and more reliable and faster technologies will enhance the digital environment. In architectural design tasks communication can happen visually as well as verbally. There are different challenges when trying to enhance communication in digital environments. Both questions of design and technical issues have to be solved, and the motivation for the educators to communicate has to be present.

The attributes, advantages and disadvantages of creative problems must be considered in building up a balanced curriculum. For example, compared to descriptive problems, generative problems tend to have less cultural information. In describing an existing work of art, a student is confronted with the subject matter, but in creating new work, a cultural context needs to be provided [4]. Objectives for future digital design teaching include testing how to extend the playful problems and improving the context in which they are introduced.

The introduction of the computer into the design process both engages the changed environment in which the sketch is deployed and is a vector in that environment of chance –see figure 2.

Figure 2. The steps in revision process of the design studio environment.




The fair test of immersion/integration in the current topography of the design process is an assessment of the procedural pivot that is the sketch's present role, an examination of current agendas which it fails to engage effectively and an enquiry into the originatory/manipulatory powers of current generation PCs. The strengths of the digital moment are needed to reinvest and reinvigorate the power of the sketch [5].

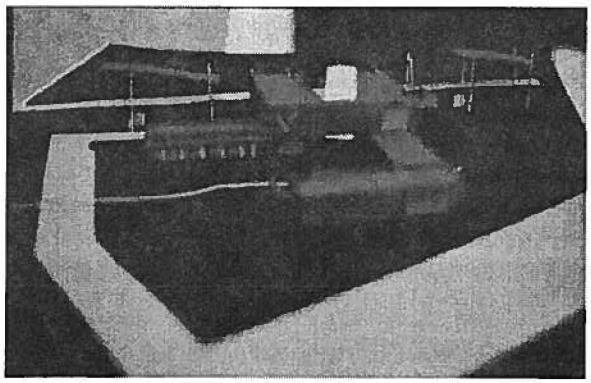
As an example for the conceptual and experimental approach to teaching and learning of design process –see figure 3., the last part of practice in spring term, 1999, there are some selected projects which include three themes of transportation buildings from the group of R.Yamacli: A club and market on Mediterranean Sea, a station building for a cable lift system from university campus to the other campus, Eski°ehir in Turkey, and a railway station and market-place in university campus, Eski°ehir.

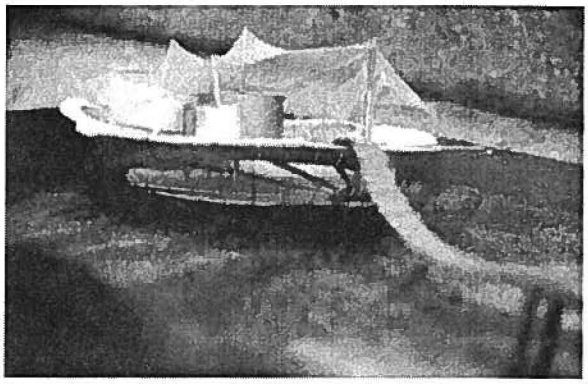
While it is true that focus on design about transportation buildings diverted attention that would otherwise be given to design concerns such as structures, constructions, circulation and aesthetics. In the other words, a change in emphasis is needed. During that critique we had been particularly hard on the students for all basic architectural concerns. In the limited time allowed for studio projects, some things become emphasized and some are neglected. All the students incorporated

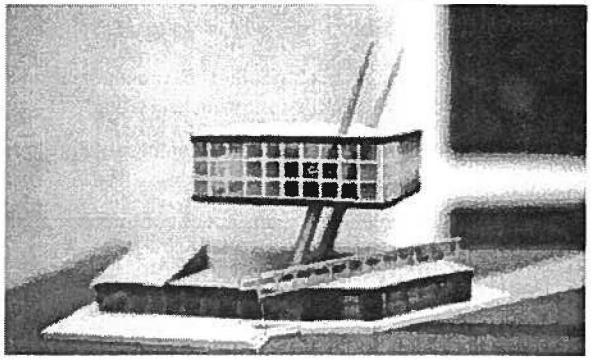
basic access in their buildings. Many of their project themes were one story and they were pre-occupied with the form and symbolic meaning of their building designs. The technical knowledge necessary on accessibility is not extensive for the studio projects at this level. In this period, the design method which developed according to not only a systematic curriculum but also spontaneously existence process for students and teachers.

Clearly, if we wish to use the structure and operations of computer graphics in the teaching of such design literacy, the student must first be knowledgeable in computer graphics [6]. There is no question that today's computer/electronic technology is rightly responsible for bringing virtual architecture to the fore, but it is also a serious mistake for architects and designers to remain unmindful of the virtual realities of architecture that have absolutely nothing to do with computers. As to the potential similarity between a video game experience and a virtual tour of a computer model, yes the two experiences are probably very close indeed, but we would caution that the two experiences also serve too very different purposes, and thus their comparison is limited. I don't think this is necessarily so. Instead of looking at it from a strictly traditional architectural point of view, maybe the videogame architecture is more of a virtual architecture, and it has something to teach traditional architecture about being in this realm. Traditional architecture education is about having a camera simulate a path through a building to look at perspectives, doing a walk-through or fly-through, but without the reality of 'habitation', and instead, are treated in the worst sense, like hands-off, clean-room objects to revere and worship the cult of personality. in terms of defining architecture in a traditional sense, inhabitation, visual information would also be inhabited architectural education to some degree.

Figure 3. An architectural design studio's conceptual approach on visual and experimental information. 1998/99 Spring semester, student's works from presentation studies in the architectural design studio: 2nd and 3rd class projects in the Anadolu University, Department of Architecture. Students; O.Pekeren, G.Baran and D.Togan (Photo: R.Yamacli, 1999).







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All the while, architectural education seems to continue to focus on a design philosophy, paying little attention to the explosion in complexity of functional criteria, costs, increasingly intricate codes and standards, rapid advancements in construction technology and architectural product production technology, team and development management, etc. All of which must form the stock and trade of most of the architects who survive, much less prosper in the late twentieth century [7]. In conventional working, a great deal of design time is lost as proposals are passed to and from between the architect/ student –who tends to be the originator- and the other specialists members/ educators of the design team –who tend to the checkers -. It is entirely practical for all members of the design team to have access to, and operate on, the common design model whether or not they share a design office. The models, then, can provide a strong integrating force in design team working [8].

In this paper, we hope that an approach system such as ours will bring more people into the architectural design process and will allow contributions beyond simply voting for a particular alternative or registering a particular desire.

## STRATEGY AND EPILOGUE

The practice of the studio shows the importance of developing a vision of the whole, of distinguishing between component and concept as different levels of knowledge. The need to balance between passive knowledge and active knowing, between the whole and the parts, is not peculiar to architectural design, but applies to all domains of professional practice. Therefore, it seems reasonable to conclude that the studio approach has a promising role to play in the development of knowledge/knowing in whatever other domain, thus also business education [9].

Curricula often reflect varying emphases among these and other disciplines. Architectural education has many other parallels to education for the other professions: it requires prescribed preparation; it extends to the graduate level; it involves a basic body of knowledge interpreted by active professionals; it includes specialists, often from other fields and disciplines; and it is accountable to a licensing examination [10]. Architectural design education needs a new focus. The approach is that of the static/dynamic aspects of the building design. Although educational does allow action, it was explaining of something of 'interaction' that is, like a graveyard can hold the artifacts of the past for observation, possibly like an archaeological reconstruction of a place, or, in the flesh, one can be inside the building as it exists, with people, with attributes, with experience of space-time, that is, an alive architecture to experience as a building, electronic. Lastly, the model aims to comment on two- dimensional and three- dimensional representation and visualization. The issue is the time spent teaching this skill and its relative importance weighed against talent and exposure. Architectural education has to prepare students to enter the workforce and to be proud of their role in the ongoing work of the society. In this approach, the design education strategy ought to be one of identifying the skills that will meet the needs of the student.

Tools and environments are distinct ends of a system and need to be addressed and used at different levels of the integration discourse. In the design and implementation of the technology classroom initiative for future, we identified a number of long-term issues that impact strategic planning and budgeting. Some of those issues are as follows [11]:

- Life-cycle funding for hardware. This includes primarily hardware maintenance and upgrades. Often additional memory, faster chips, or add-on special purpose boards can provide needed additional functionality and speed. Timing and pacing is very important in a classroom setting; thus, classrooms should have fast and powerful systems. Another factor in the life-cycling of hardware are the continuing evolutions and improvements in the technology itself.
- Life-cycle funding for software. This includes budgeting for software upgrades.
- Networking and data storage capabilities. Programs and files are increasing almost geometrically in size, making effective networking even more significant as part of a total campus environment. Faculty need to be able to access data and files from the computers in their office and homes as easily as they do from their local hard disks.
- The people part of innovation and technology is often the forgotten or neglected part of the innovation investment. Support people and organizations are needed for the design and implementation of classrooms –to support the maintenance and daily operation of the classrooms and to train and support faculty in the use of the technology in the classrooms.

Digital design requires linear thinking for technical aspects, and lateral thinking for creative aspects, different aspects of childhood play can be developed. The systematic learning needed for the complexity of the digital architectural studio applications could be taught through a series of steps. In contradistinction to the analytical, hierarchical and prosthetic approaches frequently adapted by the architectural institutions, a systems approach and an global paradigm to understand and comprehensively integrate digital technology with architectural curricula. The usual approach to the integration of the computers into the architectural curriculum has been to integrate the computers into the curriculum or design studio. Lateral thinking strategies, which are at the heart of open-ended play, could be embedded into design exercises to stimulate the creative side of digital design. Architectural design is half a technical task, requiring skill, organizational and managerial ability, and method. The other half, contained in the adjective, is a synthesis and creative work. The educational experience of the design studio is enriched by the contributions of both professors and specialists. The internet makes it possible to integrate the involvement of specialist know-how during the appropriate phases of the studio.

In the near future, machine intelligence, better user-interface design and more reliable and faster technologies will enhance the digital environment. Simultaneously, new strategies are being developed to support collective creative processes. Some of these strategies will develop only in digital form, while others may be applicable to analog settings as well. Another important aspect is that people are feeling more and more at ease working on the computer, such that the computer can stimulate rather than inhibit creative work. Future networked environments can be envisioned as comfortable and intelligent places where the virtual team feels at ease and yet challenged to engage in the task at hand[12].

Since design students need to exercise the creativity that is so plentiful in children, we need to find ways to incorporate more playful attitudes throughout the design curriculum. Injecting the freedom of childhood play could increase

student comfort while also increasing creative achievement. The invited others to document the strengths and limitations of teaching techniques and learning exercises so that a clear menu of possibilities would be open for discussion and refinement. This is particularly important in the digital design area, where sharing strategies for teaching that incorporate creativity will allow us to take fullest advantage of technical advances[13]. The use of the digital technology as an information–sharing device has changed the architectural design process in the last ten years. Collaborations using computers happen all the time within a small group of people in an studio to a city or country between different schools and now across the world using the digital sites as a medium of communication.

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