

Interactive Methods of Design Education as the Principles of Social Implications of Modern Communities

Pelin Yildiz

Abstract—The term *interactive education* indicates the meaning related with multidisciplinary aspects of distance education following contemporary means around a common basis with different functional requirements. The aim of this paper is to reflect the new techniques in education with the new methods and inventions. These methods are better supplied by interactivity. The integration of interactive facilities in the discipline of education with distance learning is not a new concept but in addition the usage of these methods on design issue is newly being adapted to design education. In this paper the general approach of this method and after the analysis of different samples, the advantages and disadvantages of these approaches are being identified. The method of this paper is to evaluate the related samples and then analyzing the main hypothesis. The main focus is to mention the formation processes of this education. Technological developments in education should be filtered around the necessities of the design education and the structure of the system could then be formed or renewed. The conclusion indicates that interactive methods of education in design issue is a meaning capturing not only technical and computational intelligence aspects but also aesthetical and artistic approaches coming together around the same purpose.

Keywords—Interactive education, distance learning, design education, computational intelligence.

I. INTRODUCTION

THE advent of internet tools and the widespread distribution of the internet are opening new windows of opportunities for educators. These new low-budget tools allow for more choices with regards to how, when and where information is shared between the instructor and the students, with promising results. Most of the distance education research has found that students in well-designed distance education courses perform as well as students in well-designed traditional courses. At the same time the need is rising for instructors to find more economical methods to educate students. These are the driving forces behind the frantic development of new distance education tools which are revolutionizing the education industry [12].

There have been many technological dawns in the last 30 years, during which the desktop computer and the Internet have been developed; but there have been similar dawns

throughout the 20th Century—film, radio, records, broadcast television, audiotape, videotape, programmed learning machines, etc. Developments in paper/printing technologies have had far more influence, with the consequence that face-to-face discussion and paper resources still dominate public education [11].

II. INTERACTIVE EDUCATION

In its capacity as a tool, Internet is a real great medium for all the educational institutions. In its capacity as intellectual challenge, it is without precedent in the educational history of mankind. The importance of Internet in education, particularly using its Web is a well-recognized fact. A wealth of resources and techniques now exist which serve as a source both for exciting examples of new teaching practices, as well as easily accessible methods for adoption into various formats of teaching and learning. Internet technology allow teachers and students keep up with their minds. It let them try their ideas as soon as they come up with them. Generally, students appreciate the convenience, choice, and flexibility that an online courses offers [11].

Instructional designers value the standardized framework and flexibility. Many instructors believe that an on-line course is convenient; they applaud the ease of record keeping and the reduced travel. Administrators like the idea of automated, consistent assessment information and the reduced costs that it can bring to an education institution. As a broader array of communication tools is developed, course designers need a better understanding of what kinds of communication each medium is best suited for learning/teaching environments. The single biggest advantage in on-line learning programs is the interactivity they offer [11].

Educational Methodology - Once the objectives have been identified, the planned interaction between the class and the instructor can be designed choosing among the following methodologies [12]:

Lecture - This includes any transmission of knowledge through audio and or visual presentations that is a predominately one-way in nature, not limited to traditional lectures.

Discussion - The use of video, audio, and document conferencing technologies can be used to promote discussions

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that help students comprehend, analyze, synthesize, and evaluate the knowledge being transmitted.

Project based learning - Individuals or teams of students apply directly the concepts being taught and develop advanced skills that are achieved through the learner's interaction with the subject matter. The roles of the instructor are to provide structure, feedback and modulation of the task difficulty.

Modeling and experimental simulations - Models provide students synthetic environments to experiment and apply their knowledge. This method is very promising since it allows for active learning and effective motivation with the growing interactive and virtual reality capabilities.

Independent study - Multimedia, hypertext, and hard copy documents are used to provide and enhance the knowledge, comprehension, analysis, and synthesis skills of the students. Computer-assisted instruction can also allow the student to apply the knowledge shared while providing immediate personalized feedback and monitoring. This allows for modulation of the level of challenge to enhance motivation.

A good interactivity is hinged on the mainstreaming of instructors with their specialized background, getting into more generalized leadership roles. It is only there that they can ensure that creative collaboration and orchestration of on-line teaching/learning. A good Web-based design might not be in design at all, but in bringing design into mentoring and the leadership [11].

Web-based learning can be a flexible and cost-effective alternative to classroom learning, but it can also be a colossal waste of time and money if not implemented correctly. One of the biggest issues facing universities wading into on-line learning is interactivity, both in its level and mode. As the cost of technology decreases, many universities are finding ways to bring the benefits of the classroom into a distance-learning setting [11]. However, distance teaching has been described as an industrialized form of education, characterized by rationalization of process, division of labor and mass production. The new information and communication technologies can facilitate this development, but only if policy makers are sensitive to the opportunities, especially at an international level. Web-based teaching and learning call for a serious reconsideration of the effectiveness (especially in light of increased demand for education and the opportunities for increased student motivation by new technologies) if integrated with knowledge-based design sites [11].

III. INTERACTIVE METHODS OF DESIGN EDUCATION

If you are using *Word*, use either the Microsoft Equation Editor or the *MathType* add-on (<http://www.mathtype.com>) for equations in your paper (Insert | Object | Create New | Microsoft Equation *or* MathType Equation). "Float over text" should *not* be selected.

As a communication design discipline, interactive media design has the closest relationship with architectural design in terms of "spatial exhibitions". With this point of view, some

courses aim to teach how interactive media is displayed as an object in physical space. At the beginning of one of these design courses, students were first thought to be given some types of exhibition spaces as museum and galleries, convention and trade centers and public places, and some basic space planning principles related with them. But later, it has been concluded that it would be more suitable to introduce the common basic principles of all exhibition spaces thinking that teaching students such kind of knowledge which architects should know is unnecessary. In the direction of this developing view, it is decided to classify the course into 2 groups such as "general theory" and "basic practice" [10].

In theoretical part, it is specified to introduce basic principles and approaches in different exhibition spaces in terms of:

- analyses of human factors in proportions and perceptions
- spatial use of light, color, and texture
- specification of style which will be adapted to the space by means of the exhibition theme with examples.

semesters	Studio Experience	Design Practice	Design Theory	Technical Skills
1 & 2	Basic Design	Picture Composition	Design History	Computer Skills
3	Basic Typography	Sound Design	Interactive Design Theory	Basic Programming
4	Identity Design	Illustration		Programming
5	e-Learning Design	2-D Animation	Film Readings	Advanced Programming
6	e-Shopping Design	3-D Animation		
7	Game Design	Space Composition		
8	Info-Kiosk Design			Electives

Fig. 1 [10] Semesters and lessons

In the practice part, it is decided to make exercises about which points to take care of, in the settlement of interactive displays that are exhibited in stands situated in different places in a space [10]. This is especially the most basic difference teaching "space design" in architecture and communication design.

Moreover, it has been considered that by organizing a stand, the student will work much more freely in the direction of the permission given by the exhibition hall and the human eye's perception limits, going away from the standards which are not directly related with the communication design but which concern mostly architectural ergonomic standards such as door, window, ceiling, height, etc. [10].

From this perspective, it will be required of the students to work on 6 different situations from all closed case to all free

case of a stand model based on Palladio's cross plan used in most design theories in the past. For the display's concept and the orientation of the spectators, it is expected from the students, according to this situation, to develop proposals about [10]:

- situation of interactive displays
- vertical partitions
- horizontal partitions
- manipulations on levels
- light, color, and texture
- information design of the stand

Psychological studies of human-computer interactions have focused, for the most part, on attempts to understand the nature of human cognition and learning. Some of the issues that are frequently discussed in the formulation of these studies are: the nature of memory and mental structures, the nature of conscious and unconscious attention, response time and time to learn, the nature of errors, learning and problem solving strategies, the role of language in cognition, encoding processes and gulfs of understanding [8].

Graphic design principles focus on issues of composition: layout, weight, color, positive/negative space and balance; color: color combinations, colored type and the psychology of color; type: typeface, type styles, legibility and the psychology of type; and graphics: graphic elements, color, placement, and integration into an overall design. Many of these principles have a strictly physiological basis. Finally, evaluation principles focus on the questions that authors of computer-based instructional materials must answer to evaluate the effectiveness of the design decisions that they have made [8].

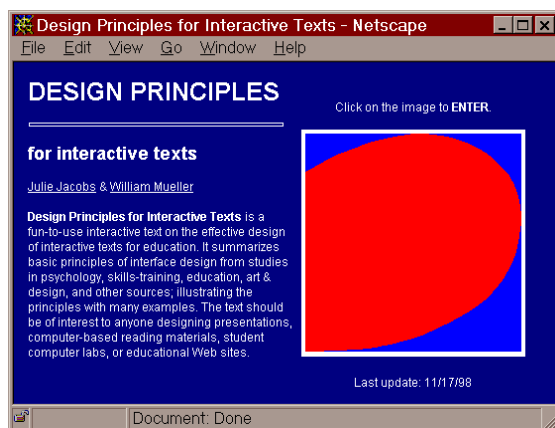


Fig. 2 Design Principles for Interactive Texts

It is important, when attempting to distill common principles from so many sources, that design principles be distinguished from design *guidelines*. Design guidelines appear frequently in industry sources. Guidelines are rules. They tell the designer, for instance, to always use blue in the logo. Their goal is consistency and predictability [8]. Often, these rules have been followed by large teams working on a single project for a single company. The success of guidelines is usually measured by the success of the projects themselves. While many project guidelines incorporate sound, generally

applicable design principles, they just as often reflect organizational, production, marketing, or (in the case of controlled studies) experimental considerations. In respect, it is attempted to avoid design guidelines in the text [8].

Design principles, on the other hand, appear in sources across many disciplines. They are common beliefs, held by interface designers from all areas of study. Each area has its particular terminology for these principles, as well as its particular emphasis on how to use them. In the text it is also attempted to put these principles into a common language [8]. Unlike guidelines, principles are not strictly rules. Taken together, they may sometimes be in conflict with one another. Individually, they are sometimes used most effectively when their specifications are deliberately, and noticeably, disobeyed. As a result, design principles take place somewhere between art and science. Although most of the principles presented in the text have a source in controlled scientific studies, every such study is necessarily circumscribed by its particular quantification of the human side of the human-computer interaction [8].

As art and design educators, there is no more powerful way in which to affect change in the world than through giving our students the power of vision and voice. In each course given, students study some aspect of how to create: to compose, paint, draw, set type, photograph and produce. Lecturers could teach them how to solve problems, organize information, tell a story, and create clear and beautiful presentations. Unlike specific tools and methods, purpose is not something given to students [9]. Lecturers can, however, challenge them with the question, and help them find ways to examine why they will create. At the core of this question is another question; what will they be putting into the world through their art and design? It is through this question that students can begin to consider the changes their work will bring about. In addition to a sense of purpose, an artist/designer who wishes to affect change in the world needs to develop the two most important tools of all their vision and their voice.

Vision is not the ability to see the future, but rather the ability to clearly see the present, evaluate it in the contexts of social, political and cultural environments, and then imagine what the future could look like. Vision is about clarity; seeing beyond conventions, habits, surface reactions and disinformation—to reveal a true picture of a problem or condition. It is supremely important that we help each student develop his or her clear and unique vision.

The first key, how to teach students seeing clearly is through teaching them *critical thinking*. These manifests in several areas in the education of an artist/designer [9]:

- through teaching about culture and politics, through teaching how to research,
- through teaching about processes in the development of meaningful work,
- and through helping students discover where they can fit in the sociopolitical world. There are also effective exercises in developing how students see, in courses such as photography, typography, drawing and creative writing.

In these courses, students can be challenged to view objects, places, people and situations through a variety of different lenses. Upon completion of courses like these,

students often see the world around them differently. It is important to emphasize, at this point, that the vision each student develops must be his or her own, and not overly influenced, or determined, by the vision of the teacher [9].

Interaction design is a multi-disciplinary field. In the context of design schools, interaction design is informed by two fields – visual communication design and product design. Additionally, it draws from many areas that have been traditionally allied with design – ergonomics, human factors, cognitive psychology, writing and rhetoric, advertising, anthropology and ethnography [7].

In the industry, this field is also influenced by and depends deeply on fields that have traditionally not been close to design – computer science and engineering, software engineering, electronics, library sciences, information sciences, operations engineering and business process re-engineering.

In job listings, interaction design is often confused and used interchangeably with overlapping disciplines—usability engineering and information architecture [7]. Other job titles appear occasionally, with expectations very similar to those from an interaction designer – user interface designer, usability designer, GUI specialist, user experience designer etc.

IV. THE ANALYSIS OF SAMPLES FROM DIFFERENT COUNTRIES

In the 1980s, people involved in the design of interactive products typically came from training in cognitive psychology and human factors for many years. This was particularly so in the USA and Europe. As an example, below are the multidisciplinary approaches of the *Industrial design Centre* (IDC) to design education in general and specifically to the education of interaction design in recent times [7]:

Location: To start with, location of IDC plays an important role. IDC is based in the Indian Institute of Technology, Bombay – a leading technology university in India with all leading branches in engineering. IIT Bombay also has a leading management school and an active department in humanities and social sciences. Future designers, engineers and managers rub shoulders regularly – in the library, in the hostels, at extra-curricular events [7].

Input: The post-graduate programme in IDC invites graduate students from engineering, architecture and arts – so each class is necessarily made up of people from multiple disciplines. In group activities, students learn work with each others' strengths. In individual activities, students learn a lot about the alternate approaches from the discussion of their classmates' work.

Education: In IDC, design is considered to be goal-driven, creative problem solving process. Emphasis is shared between design process, concepts, sensitivity and execution skills. In addition to design, students get inputs in allied areas such as ergonomics, cognitive psychology, semantics and communication theory. Students are encouraged to work in areas of unmet demand, to explore new and emerging areas. After a grounding in theories, the education in IDC is driven by assignments and projects. Open discussions are held during and at the end of the projects to invite criticisms from multiple perspectives on the decisions taken in the design process.

Inter-disciplinary Research Collaborations [7]: The research activities in IDC draw upon collaborations with technology disciplines that a leading university like IIT Bombay offers. The work in interaction design in particular has collaborative projects between IDC and the Kanwal Rekhi School of Information Technology and the Department of Computer Science. Design faculty members have also supervised projects of students from computer science and information technology disciplines.

Interaction between Students and Professionals: IDC organizes workshops on human-computer interaction design where professionals from the industry and design students work together on design problems. In other workshops they explore techniques such as contextual inquiry and usability evaluation methods. Such workshops have been mutually beneficial for students and the working professionals, as they gain multiple perspectives on the same task from each other.

The experience of the interdisciplinary approach to interaction design education in IDC has been encouraging. The interdisciplinary exposure enabled IDC students to enter early in this emerging field. By 1987, some IDC students were already selecting their masters' thesis project related to user interface design. These graduated to become some of the early professionals to make a mark in Indian and international scene. The multidisciplinary approaches lead students to tackle design problems with a holistic approach and to make things work in the practical constraints of industrial situations. Research benefited as projects that could not have been carried out independently in either disciplines became possible [7].

In the past few years it has been seen as the emergence of institutes dedicated to interaction design. Also some universities are identified by starting programs in usability engineering and information architecture, expecting the graduates to be responsible for the design of interactive products, but without sufficient inputs in design [7].

These experiences show that both these approaches are not appropriate and have the danger of producing incapable professionals with a limited view of the possibilities.

Students learn a lot within the class as well as with interaction with other students. One-dimensional input may be inadequate to enable a person to take on the entire creative responsibility of an interactive product.

In order to analyze this work we could also give a course as sample. This course is about understanding people, and understanding the culture in which design solutions exist. Through the course, students experience various contextual research methods, including Contextual Inquiry, Interviews, Focus Groups, and Questionnaires, and develop and practice unique and innovative user research methodologies. Through these techniques, they learn how to synthesize large quantities of user research, and allow research to drive design [6].

The following course outcomes indicate competencies and measurable skills that students develop as a result of completing this course [6]:

- Conduct contextual research and task analysis

- Model the observed user's behavior in various visual manners
- Synthesize gathered research using various techniques.

Create design criteria is based on quantitative and qualitative data [6].

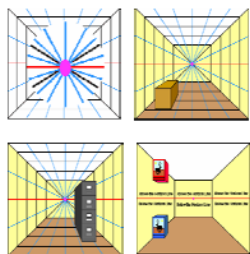


Fig. 3 The design elements

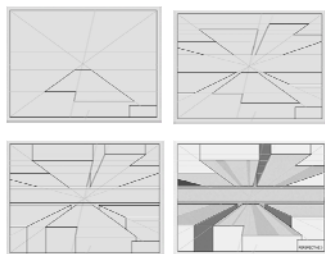


Fig. 4 Interactive Perspective drawing

V. THE ANALYSIS OF A SAMPLE FROM TURKEY

In this work to identify the interactive principles in design education a module from a university in Turkey, Gazi University could be given. In this module the priority purpose of the study is the Gazi University, the Department of Industrial Technology students as basic design. In order to activate this interactive education method a computer structure is essential and the relation between these have to be constructed. And in addition other students willing to take the basic design lessons are also obliged to enter those lessons interactively [5].

Above are the general modes of the design lessons in the concept of overall attendance at the same time. With these proposed models in design education;

- Minimize energy; maximize the effort for new pursuits in design concept,
- Achieve time in order to develop more practice work in design,
- Possibility to try more alternatives as the main principle in basic design education, etc.

The interactive education could be supplied by two main modules: synchronous and non-synchronous Interactive Education.



Fig. 5 The introduction page



Fig. 6 Another page in the model



Fig. 7 Some sketches on web



Fig. 8 Criticism approaches

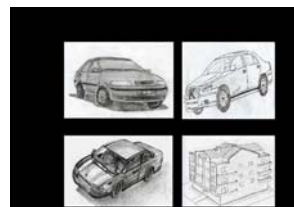


Fig. 9 Other criticism approaches in basic design [5]

In the table in Fig. 10 some models for distance education could be identified. The researches show that the most efficient model is the; synchronous interactive education models with interactive means. In this method the purpose is to reach a practice with both conventional methods and contemporary technologies.

The Methods in Interactive Education			
Synchronous Interactive Education		Non-synchronous Interactive Education	
Interactive	Passive	Interactive	Passive
The lesson is given to all the students at the same time and the students are permitted to attend the lessons actively at the same time.	The lesson is given to all the students at the same time but the students are not permitted to attend the lessons actively at the same time.	The students are able to reach the information of the lessons whenever they want. The students are not able to reach the lesson at the same time. But they could communicate by mails afterwards.	The students are able to reach the information of the lessons whenever they want. The students are not able to reach the lesson at the same time. They could communicate actively.

Fig. 10 The alternative methods in distance education

VI. RESULTS AND CONCLUSION

The *advantages of the integration of interactive opportunities in design education* are;

- Earning the most important criteria in education as time,
- Possibility for developing different alternatives in design education,

-Putting forward new horizons in the dialog of the teacher and the student by new approaches in order to develop the social and communicative powers in education,

-The personal and systematical education opportunity,

-Increasing the qualitative quantities of education by contemporary approaches, etc.

On the other hand *the disadvantages of the interactive education* could be considered as;

-The negative effect on the uniqueness of design education when the system is not used by all means,

-The delicate quantity of design education could be decreased when there is a wrong decision of these system whether for which lesson it has to be used or not,

-Some problems could occur in education if the synchronization of the use of interactive methods with traditional ones in optimum relations,

-This method could decrease the importance of hand drawing skills etc.

As a conclusion it could be identified that; the integration of interactive methods in design issue is a delicate process. The qualified teachers with this method, the lessons to be adapted in this system and the importance of hand drawing skills should not be forgotten. So this contemporary education programs could be integrated in synchronization with artistic approaches regarding unique features of design education with good balance.

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