

# Education of Interaction Design – an Interdisciplinary Approach

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## **Abstract**

The field of interaction design is multidisciplinary in nature. A professional interaction designer needs to take the central responsibility towards all creative aspects of an interactive product. This alone can ensure that well-designed interactive products will emerge with conceptual integrity that proceeds from the thinking of one mind. Education of interaction design therefore needs to be multidisciplinary.

The Industrial Design Centre (IDC) in IIT Bombay has had an interdisciplinary approach towards design education for several years. The results of this approach have been very effective for the field of interaction design. In this paper I share our experiences in this approach and suggest an agenda for future work towards strengthening the multidisciplinary nature of interaction design education.

In the past few years we have seen the emergence of institutes dedicated to interaction design. We have also seen some universities starting programs in usability or information architecture without sufficient inputs from design. I believe that both these approaches are not appropriate and have the danger of producing lopsided professionals with a limited view of the possibilities.

The future will see the birth of a new profession, based in design, but drawing additional strengths from several fields. Design schools offering programs in interaction design will do well by becoming more interdisciplinary and finding ways of developing well-rounded professionals for this future.

## **Key words**

Interaction, design, education, multidisciplinary

## **1. Introduction**

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.

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. 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.

## **2. Design by Committee – Taming the Interdisciplinary Beast**

*“Conceptual integrity [of a product] dictates that the design must proceed from one mind, or from a very small number of agreeing resonant minds.” [a]*

An analogy has been drawn between the making of a film and the design of an interactive product [b]. Both fields are inter-disciplinary and require creative people with varied backgrounds to work together. Film making is a mature field with a language of its own that has evolved over a hundred years and many generations of film-makers and film-viewers. There is a lot that interaction design can learn from its mature cousin.

How do film-makers avoid the problem that plagues interdisciplinary fields – the design-by-committee phenomenon? The answer lies in a ‘central creative ownership’. The director of a film has absorbed enough of at least four professions – script writing, cinematography, acting and editing. Script writers, cinematographers, actors and editors are all creative professionals and do make significant, at times brilliant individual contributions towards the success of a film. But essentially, the director is the person responsible for all creative aspects of a film during its production. He is the *film maker*.

Such central characters have evolved in many mature fields where multidisciplinary teams of creative individuals need a way of working together – the surgeon in an operation theatre, the captain of a sports team, the captain of a ship, the conductor of an orchestra.

There is a need for a profession, a role, which takes complete creative ownership during the development of an interactive product. When the field of interaction design matures, such a central character will emerge. Conversely, when we start getting well-designed interactive products with conceptual integrity that proceeds from the thinking of one mind, we can say that the field of interactive product development has matured.

For the purpose of this paper, let us call a person with central creative ownership of an interactive product the *‘interaction designer’*.

Please note that just like in films, creative ownership in interaction design does not imply legal or financial ownership. Nor does it imply a position of authority or management – the authority to determine the salary of an individual for example or the capability to manage conflicting schedules.

Such an interaction designer needs to work with a multidisciplinary team. He needs to understand enough of each discipline, to make sure that each individual in his team has the freedom to flower. He has to ensure that the overall product is emerging fine, with the desired impact on end users and with a central creative vision. Education of an interaction designer, therefore, also needs to be multidisciplinary.

### **3. The Interdisciplinary Approach in IDC**

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. Only recently have designers ventured into this area. In India by contrast, the professional community in this field was clearly dominated by designers, even from the early stages.

One reason for this can be attributed to the design education in India – it has been largely broad-based and in a multidisciplinary atmosphere. As an example, I site below the multidisciplinary approach of the Industrial Design Centre (IDC) to design education in general and specifically to the education of interaction design in recent times:

#### **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.

#### **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.

#### **Combined Course**

Since the year 2000, IDC has been conducting an elective course in human-computer interaction design [c]. The course is jointly attended by post-graduate students of design, engineering and management and under-graduate students of

engineering. The course requires students to execute assignments and projects as multidisciplinary teams. In the last five years, the elective has grown in popularity.

### **Inter-disciplinary Research Collaborations**

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 [d]. 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.

## **4. The Experience**

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 exposure gears up students to tackle design problems with a holistic approach and to make things work in the practical constraints of industrial situations. It also helps in spreading design awareness among other disciplines within IIT Bombay and among the industry professionals. Research benefited as projects that could not have been carried out independently in either disciplines became possible.

However, there have also been some speed-bumps in this experience. Interdisciplinary activities are usually outliers to mainstream activities and, at times, tend to fall in cracks. Progress in research or academics in an interdisciplinary activity may not always count as progress under the yardsticks of either of the mainstreams. Progress is harder and slower, as researchers from both sides try to understand each other. These barriers however were not too hard to overcome. On the whole, the experience has been positive and rewarding for both research and academics.

In the past few years we have seen the emergence of institutes dedicated to interaction design. We have also seen some universities 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.

Our experience shows that both these approaches are not appropriate and have the danger of producing lopsided professionals with a limited view of the possibilities. Students learn a lot within the class as well as with interaction with other students. I believe that a one-dimensional input may be inadequate to enable a person to take on the entire creative responsibility of an interactive product.

Some of the turf-wars recently witnessed in the industry and on professional forums remind one of the story of the six blind men and the elephant. These turf-wars seem to have their roots in the 'purist' approach to education of interaction design.

## **5. Future Work**

While there have been some achievements, a lot still needs to be done. Here are some of the things that are on the agenda towards more multidisciplinary approach in interaction design education in IDC:

- We are working towards a dedicated post-graduate program in interaction design. The proposed curriculum in this new program is an attempt to conduct a specialized program while retaining the multidisciplinary character. This is being attempted by retaining the core courses in traditional design, specialized inputs relevant to interaction design and a greater flexibility of a large number of electives.
- We seek additional inputs to interaction design students in the areas of computer science and software engineering, with a particular emphasis on boundary objects and techniques between software engineering and interaction design.
- We seek additional inputs in the areas of management. This pertains not only to project management, but also areas like service design, system design and entrepreneurship.
- In addition to more combined courses across disciplines, we seek joint masters level thesis projects between design, technology and management students.
- We seek buy-in from more participants – faculty members, researchers, students and industry professionals – towards the advantages of interdisciplinary approach to interaction design education.

## **6. Conclusion**

The future will see the birth of a new profession, based in design, but drawing additional strengths from several fields that inform the development of interactive products. Experience with a multidisciplinary approach to education in design has been fruitful so far. Design schools offering programs in interaction design will do well by becoming more multidisciplinary and finding ways of developing well-rounded professionals for this future.

## 7. References

- a) Brooks, Frederick P. Jr, The Mythical Man-month, Addison Wesley Longman Inc., 1995, page 44
- b) Joshi, A, Interaction Design in India – Past, Present and Future, CHI 2004, Vienna, 2004
- c) IT 604 Human-Computer Interaction course home page,  
[http://www.idc.iitb.ac.in/~anirudha/it\\_604.htm](http://www.idc.iitb.ac.in/~anirudha/it_604.htm), accessed on December 2, 2004
- d) Projects in Media Labs Asia, IIT Bombay Lab,  
<http://www.mlasia.iitb.ac.in/projects.htm>, accessed on December 2, 2004