CURRICULUM FOR PG PROGRAMME IN DIGITAL DESIGN: RESEARCH & INDUSTRY ORIENTED

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ABSTRACT

PG (Post-Graduate) programmes are either research focused (inquiry-based) or industry focused (application-based) in terms of final placement of these students. In this era of rapidly evolving and changing knowledge base, even industry requirements alter from time to time. In context of changing scenarios we believe that for any PG programme research focus and industry focus are complementary to each other. We at National Institute of Design (NID), Research & Development (R & D) Campus, Bangalore, India were initiating a new PG programme in the area of digital design. With this as the background we set up the curriculum for the new programme "Design for Digital Experience (DDE)". We perceive Digital Design and experience as encompassing four broad areas such as *Software products and services*, *Gaming & Entertainment*, *Digital Knowledgeware* and *Digital products* like handheld gadgets and devices. This is a two-year programme spanning four semesters. The first three semesters are structured around the four broad areas as themes and the last semester allows each student to carry an independent project with the industry. This paper attempts to share our experience in terms of vision, the process and teaching-learning methodology outlined for DDE programme.

Keywords: Design education, Digital experience, Digital Design

1 INTRODUCTION

Design for Digital Experience (DDE) is a recently introduced (launched in June 2007) two year PG programme being offered at National Institute of Design, R & D Campus, Bangalore, India. Graduates from diverse fields such as Engineering, Fine Arts, Architecture, Computer Application, Mass Media, etc are eligible to apply for this programme. DDE aims to primarily focus on human experience in the context of designing products (information kiosks, handheld communication and navigation devices, and other e-products) and services (e-health, e-banking software applications, and digital libraries) in the digital/electronic domain. We perceive Digital experience and design as encompassing the following broad areas

- Software products and services
- Gaming & Entertainment
- Digital Knowledgeware
- Digital products like handheld gadgets and devices

This programme contains context similar to programmes such as Interaction Design, User /Interface Design, New Media Design and HCI.

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Being a Design and R & D institute, we looked at this programme in the context of Design and intend to focus on research based outcomes. PG programmes are either *research focused (inquiry-based)* or *industry focused (application-based)* in terms of final placement of these students. In this era of rapidly evolving and changing knowledge base, even industry requirements alter from time to time. In context of changing scenarios we believe that for any PG programme research focus and industry focus are complementary to each other. The paper outlines the concepts and the process for deriving the curricula for DDE programme.

2   THE PROCESS

The curriculum for the DDE programme evolved in phases over a span of one year.

Phase 1 - Initial curriculum was based as an optimal mix of the three PG programmes Software and User Interface Design (SUID), Information and Digital Design (IDD) and New Media Design (NMD) already being offered from NID, Gandhinagar. In view of giving certain impetus to research in this proposed curriculum, components of research in the form of 'Research Methods & Research writing' and independent unit of research based study in the area of 'Information Technology and Digital products' was planned to be included.

Phase 2 - Stakeholders meet had representation from leading IT industry, academics from engineering and Design institutes. The outcomes that came of this meeting were as follows:

1. The utmost quality that needs to be promoted in an individual is 'learnability' (ability to adapt and learn quickly and know-how of diverse areas) along with development of creative attitude, and communication skills.
2. The IT industry spelt out that their desirable design employee should be a combination of 'specialist' + 'generalist' in view of the role designers' play today as coordinators and problem solvers within multidisciplinary teams.
3. Individuals should be informed about business processes such as responding to clients, setting up a business, development cycle of a project in a typical business scenario etc.

Phase 3 - The Institute under the chairmanship of the Director, NID; constituted a Curriculum Working Committee (CWC) for the formulation of curriculum. The members of the CWC were mainly faculty from the three campuses of NID, Founder Director of a leading Indian design company in the area of digital products and a senior faculty from a leading technology institute of the country.

Some of the salient recommendations of the CWC were as follows:

1. Articulation of the terms 'Design +Digital +Experience' in four *broad areas*
a) Digital gadgets (handheld devices such as GPS products, camera, mobiles etc)
b) Gaming and entertainment
c) Software Interfaces (products and services)
d) Digital Knowledgeware (e-learning, e-books, digital libraries, virtual museums)
2. Structuring semesters around *keywords* as enlisted
a) Semester 1 (Design skills + Design Knowledge)
b) Semester 2 (Practice knowledge)
c) Semester 3 (Guided Application)

The combination of the *broad areas* and *keywords* provided the overarching themes for each semester and helped us envision the courses and classroom projects. The broad areas gave focus in terms of context for classroom projects   (Web application,

interactive products, gaming) and the keywords served as guide for gradual progression for the students in terms of building skills, knowledge, synthesis and application.

3. Focus on student projects that look at localization of digital products to Indian context.

3 CONCEPTS BEHIND CURRICULA

3.1 Learnability

'*Learnability*' is being regarded as one of the most important quality that an employer looks for in his prospective employees. The concept of learnability has been referred quite often in computational engineering literature, however recently it has been used more commonly by the human resources. In the words of Narayan Murthy (Founder Chairman, Infosys, India) "Learnability is the ability to extract generic inferences from specific instances and using them in new, unstructured situations and high premium is placed for people with high learnability quotient." In view of today's evolving design education Buchanan [1] recommends a harmonious integration of different kinds of knowledge domains such as fine arts, engineering, social sciences and practice-based principles as these provide the knowledge-base to make effective and valuable products. Faiola [2] proposes 'The Design Enterprise Model' for HCI and interaction design education which encompasses social science, design, business and computing as primary knowledge domains, highlighting the fact that designing interactive products draws upon multiple knowledge domains. In view of the above we believe that giving students an exposure to diverse instances (inputs in diverse domains) will improve ability to learn, analyze and apply the deduced information for problem solving. DDE programme curriculum draws concepts from diverse fields such as industrial design, communication design, social sciences, humanities, computer sciences, design management and business. In this era of ever expanding knowledge bases, an individual who has understanding of multiple knowledge domains is at an advantage for lateral movement in view of the blurring boundaries that we presently experience between different fields. In the words of Koshy [3] "The development of IT and related service sectors call for a new breed of designers with ubiquitous design approach just as ubiquitous computing."

3.2 'Generalist' + 'Specialist'

The four broad areas such as Software products, gaming & entertainment, digital knowledgeware and digital handheld products provide the thematic context for projects as well as courses in each semester. Every student will be able to explore each of these areas through a project-based approach with supporting theoretical inputs; realistically will have worked on a single project in a particular area, making them essentially generalists. The kind of diploma project (final semester) that the student takes up with the industry will take him towards being a specialist in his/her area of interest.

3.3 Scope for repetitive learning

Eder and Hubka [4] postulate need for *repetition in learning* by seeing/hearing/reflecting using the same subject matter in different situations. This implies that certain design concepts and research methods need to be repeated at different intervals of the DDE programme for comprehension, assimilation and application of these concepts within varying contexts. For eg. the course "User Experience Design" covers research methods and strategies for all the three semesters of the programme with gradual progression in content. A second kind of repetition

happens when students apply some of these research methods and strategies for their individual class projects over the semesters.

3.4 Problem-Based Learning – an adaptation

Problem based learning(PBL) as a model was developed in medical education in the early 1970's and has been adopted in several other areas of teaching and learning including architecture, law, engineering [5]. The model for DDE programme is an adapted version of PBL. This differs from Schon's [6] model of 'studio based learning/reflection-in-action' where individuals learn by working towards solving a problem with focus on content of the problem. In our case theoretical inputs are equally important goals of learning. The term 'self-reflection' is important but in the words of Stempfle & Schaub [7] "Self-reflection, in the sense of reflecting not only on the content of a problem, but on one's strategies in tackling the problem is of greater value." There is a close relationship between problems and solutions; varied statements of the same problem evoke different solutions [8]. A problem/project statement can broadly be looked at as

1.   Close-ended – These problems evoke images/visuals about their construction in our mind, and are current in the industry. We classify such problems/projects as '*industry focussed (application-based) projects*'.

2.   Open-ended – These problems are devoid of any kind of existing mental images. We classify such problems/projects as '*research focussed (inquiry-based)*'

3.4.1 Industry focussed (application-based)

For DDE courses, a design project is set, based on the theme for the semester which falls in one of the broad areas (Software, Gaming, Entertainment etc). Course inputs given should help students to understand the terminologies, methods and drive the design process as an individual in some cases and a team player in others. The design project provides the overarching context to align a set of courses which helps to visualize application of course inputs to certain extent for both students and faculty. Such a design project that evolves with support of theoretical inputs in the form of methods, tools and processes we term it as '*industry focused (application-based) project*' which to certain extent can give some kind of mental image of the product. This model ties a number of courses together in the form of a common project, which should in the long run take away the disconnect that students find between different courses they take up. It also brings down the student work load to certain extent as they are working on a project for a set of courses.

3.4.2 Research focussed (inquiry-based)

We have a course titled "*Digital Design & Society*" which is an independent unit of study taken up by each student across three semesters. The student chooses an area of study in the first semester, and works on the same area refining and progressively does an in-depth research. The objective of the course being

1.   Look at the state of use of digital products within the Indian local context, raise awareness about the society and the effect of products in our lives.

2.   Develop their interest in research-based outcomes and be able to demonstrate the importance of R & D in offering future products and services.

This course intends to focus more on being able to create a knowledge base with regards to usage of Digital products in Indian society rather than add another product, the aim being to be able to build a knowledge base that informs with regards to future design

directions in context of socio-cultural aspects. This course looks more in the area of open-ended research more on the lines of *research-focused (inquiry-based)* project where there is no strong sense of mental image being set for the outcomes.

3.5 Research Based Outcomes

All student projects, both *application-based* and *inquiry-based* are driven based on research methods and strategies. The only difference is the context, with application-based looking at product outcomes for today and *inquiry-based* focusing on the creation of knowledge-base to inform future design especially in context of socio-cultural aspects in Indian society. The emphasis is on User/Human-Centered Design Research, the essence captured well by Brenda Laurel [9], "Human Centered design research encompasses a set of methods and practices aimed at getting insight into what would serve or delight people. It investigates behind the scenes looking at individuals, situated contexts, cultures, forms, history and even business models for clues that can inform design. This is very different from market research devoted primarily to the final stages of development including styling, packaging, branding and advertising." Both application-based and inquiry-based projects are different ways of being informed on *User Experience* the central spine of '*Digital Experience*'. In the words of Koshy [3] "The design values like harmony, ethics, consumer delight, quality, functionality, visual culture, aesthetics and such other tangibles and intangibles are valuable in the information society and knowledge economy which is somewhat impersonal and devoid of human touch." A designer can be informed about such attributes on the basis of research. User Experience to us is the sum total of impression a user has of a digital product together with the user's comparative experiences with other objects in the environment or even real life experiences [10]. We plan to hold a National level 'Student Conference' to encourage our students into formal research writing and presentation.

3.6 Industry Interface

In our attempt to keep both the faculty and students updated with the latest industry practices and processes and help build the network between our institute and industry we have

1. *Interaction seminars* – These are talks given by industry experts and are mostly aligned with the semester thematic areas. Such seminars are warming-up kind of exercises at commencement of each theme based classroom project supported by relevant courses. They help the faculty in aligning and fine-tuning their course inputs while for the students the seminars attempt to help them visualize the upcoming project to certain degree.
2. *Expert Faculty* – Industry professionals are asked to give course inputs to students, and in others they act as reviewers for both application-based and research-based projects.

4   DDE PROGRAMME CONTENT

DDE is a two-year programme that spans over 4 semesters. In first three semesters apart from the mandatory courses and electives, students need to take up an independent unit of study 'Digital Design & Society' in which each student identifies his area of study, develops concepts to design new products and services and formally presents a paper. The first three semesters are structured around the four broad areas as themes and the last semester allows each student to carry an independent project with the industry.

The curriculum for first three semesters is theme based as follows:

Semester 1 'Design knowledge & context'

The courses offered fall under Design Fundamentals, Design & Technology, User Experience Design I & Media Studies (Visual Communication & Interactive Media).

Semester 2 'Software Interface Design Processes + Interactive handheld products'

The courses offered are User Experience Design II (focusing on User/Human-Centered Design processes), Design Cognition & Ergonomics, Product Design.

Semester 3 'Digital Knowledgeware + Gaming & entertainment'

The courses offered are Instructional Design, Digital audio, Digital Video & Effects, Gaming and animation. This semester will also look at developing a Virtual Collaborative Project keeping in mind today's need to work with global teams.

5   CONCLUSIONS

This paper outlines the process of arriving at a curriculum based on thematic broad areas associated with the discipline to keep the programme both Industry and Research focussed. We shall in future papers analyse this curricula in terms of the set programme objectives being achieved.

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