

# Dynamics of user needs analysis in redesigning an open learning website: A case from Pakistan

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## Abstract

*The paper presents work in progress and reports on the user needs analysis phase of the user-centered iterative design as applied to redesigning a website at a teacher education institution in Pakistan. The existing website was designed for student support by a team of IT experts with minimal input from the users. However, with expansion in the Institute's activities, easy access to the Internet and growing interest in the use of technology for education in developing countries, users' needs and expectations have changed substantially. This calls for a website redesign. The user-centered iterative design was found suitable for two reasons: (a) the website is aimed at audience from various contexts, and understanding their needs without their active and continuing participation would not be possible; and (b) the involvement of users is likely to give them a sense of ownership, which would encourage the use of technology in education. After a brief overview of the context and methodologies used, the paper highlights the importance of engaging users at various stages in the design of a website that is usable and stimulating for the target audience.*

## Keywords

*user-centered design, needs analysis, usability, developing country*

## Introduction

The benefits of active and on-going user-engagement in the design of a user-centered interface are well known (Gulliksen, Lantz, & Boivie, 1999). Also known are the design processes that lead to maximum usability for the product (Nielsen, 1993; IBM, 1996; Verdenburg et al., 2002). Discussions on traditional and user-centered design (UCD) indicate that traditional website design process is technology driven and focuses on technology benchmarking with limited interdisciplinary interaction in the design team. Thus, there is limited focus on user experience (Verdenburg et al., 2002). In contrast, a UCD approach places the user at the heart of design process and focuses on understanding users needs, and cognitive (Katz-Haas, 1998), socio-economic and cultural factors (see Hofstede, 1991; Marcus & Gould, 2000) that may affect user interactions with the product. Furthermore, iterative design processes "where there exists the possibility of at least one task being repeated" (Johnson, 1996, p. 52) can help correct mistakes at every stage to increase the usability of the system. In addition, chances that the system meets user expectations and requirements increase (Arnold, 2004). UCD is also recommended on the grounds that an on-going dialogue and active involvement ensures relevance, usefulness and usability of the product for the target audience (Gulliksen, Lantz, & Boivie, 1999) and the quality is tested and enhanced as the product is being developed.

This paper presents work in progress and reports on the needs analysis phase of UCD as applied to redesigning a website used as part of courses offered through Open Learning mode at a teacher education institution in Pakistan. After a brief description of the context and methodologies employed to analyse user needs, some emerging findings will be discussed.

## The context

As part of its commitment to providing quality education through its teacher education programs, Aga Khan University, Institute for Educational Development (AKU-IED) Karachi, Pakistan started an Open Learning (OL) initiative in 2000. The aim was to provide increased access to university education for schoolteachers and heads from developing countries who, for a variety of reasons, cannot attend full-time, on-campus classes. A second aim was to introduce an alternate mode of delivery where there is greater flexibility and more independence for on-campus learners than in face-to-face classes. Since its start, five certificate level teacher education courses have been offered in OL mode to educationists from Pakistan (both urban and rural), Bangladesh, India, Tajikistan, Kenya, Tanzania and Uganda.

One of the strategic decisions for OL at AKU-IED was to produce local content, and have printed learning materials, supplemented with web, video- and audio resources, where necessary. The decision was based on the needs of the target clientele and their context, comprising mostly schoolteachers from developing countries. These teachers often did not have access to computers and preferred printed materials for studies. Accordingly, it was decided to provide printed learning materials to course participants (CPs) at the start of the course. In this model, CPs were required to read the materials at their own pace and complete the assessment tasks by due dates. The communication between tutors and CPs was established through face-to-face meetings, email, telephone, post, and web-based discussion forums, where possible. This practice is currently prevalent.

A website, focusing on study support features, was also developed. The idea was to gradually initiate AKU-IED faculty and CPs into web-based learning. Thus, the focus of the website was limited to features that did not directly affect student learning, such as course outlines, announcements of new events in the OL area, and an electronic feedback form where CPs could anonymously submit questions, suggestions and problems they faced during studies.

Over the years interest in the OL website for teaching and learning programs at AKU-IED and beyond has grown tremendously. As a result, several new features have been added, such as links to an asynchronous discussion forum and study skills websites. The website, particularly the discussion forum, is regularly used by faculty teaching on-campus courses to extend class discussions. In addition, a group of tutors from rural Pakistan and East African countries are currently using it to teach the Educational Leadership and Management course in their respective regions. These tutors want the course content to be put on the website so that they do not have to carry the printed study guides when they are in the field. This feature is not part of the existing website design. The ongoing unplanned changes to the website were not aligned with its conceptual design and have resulted in many problems in the user interface. Also, the website code has become complicated and can no longer be modified for further changes. As a result, a change in the target population and their needs calls for a systematic redesign of the website.

The UCD was chosen for two main reasons: Firstly, the nature of audience for the website is diverse in terms of their cultural, linguistic, socio-economic and computer use backgrounds. It was felt that active user engagement throughout the design process would ensure that the diversity is captured in the final design. Secondly, by ensuring maximum participation of users in the design process the likelihood of its use in the educational programs at AKU-IED would increase. Given below is a brief description of the methodologies used to analyze user needs.

## **Methodology for user needs analysis**

The purpose of needs analysis was two-fold: (a) to build a detailed user profile; and (b) to identify contextual factors that might hinder and/or facilitate the website use for the target audience. AKU-IED's future strategy documents were consulted to determine the target audience, comprising AKU-IED faculty, CPs and tutors for on-campus as well as distance education courses. A range of methodologies was used to gather data for needs analysis, including qualitative interviews, document analysis, and usability testing. Details of the methodologies used are as follows:

### ***Website evaluations by CP***

At the end of each course, an evaluation form is administered to seek CPs' feedback on their experiences of studying through OL mode, the Instructional Design of materials, student support services, and the use of OL website and the discussion forum. The results pertaining to the website and the discussion forum were extracted from evaluation forms and compiled into a Word document for analysis. The analysis focused on identifying patterns in CPs' experience of the website, and their recommendations for future courses.

### ***Review of other educational websites (competitor analysis)***

Some key national and international educational and non-educational websites and discussion forums were reviewed in order to generate ideas regarding strengths and weaknesses of other educational websites so that those should be considered during the website redesign.

### ***Usability evaluation of the existing website***

Usability evaluation was conducted in order to identify memorability, learnability, efficiency, reliability and user satisfaction issues (Constantine & Lockwood, 1999) that users might face on the OL website. Two methodologies were used: Heuristic evaluation and user testing (Sing & Der-Thang, 2004). Heuristic evaluation was performed by four experts who reviewed the interface compliance with a predetermined set of usability principles (Nielsen, 1994). For user testing, eight volunteers from a group of prospective M.Ed. CPs were selected through informed consent. The users were given three different sets of tasks to perform as they explored the website, which was followed by a short interview and a post-test checklist. Testing and the interviews were video taped for analysis (Nielsen, 1993).

### ***Faculty workshop***

A faculty workshop was held to gather information about the needs of the faculty. Twenty participants were invited through a formal email invitation: twelve finally attended the workshop. These included a mix of teacher educators, research staff, web-programmers and the design team members. In the workshop, participants shared their experiences of using the OL and other educational websites, and mentioned factors that facilitated and/or hindered their learning. In small groups they were given a set of questions in which they identified teaching and learning tasks generally performed at AKU-IED, and marked the ones for which they might like to use the OL website, either as a replacement or as a supplementary tool (Katz-Hass, 1998). The proceedings of the workshop were tape-recorded.

## **Emerging findings**

The emerging findings, discussed below, are critical in how AKU-IED conceptualises the design for a socio-culturally and linguistically diverse audience.

### ***Meeting the needs of diverse audience***

In Pakistan and most other developing countries, computers and the Internet are generally considered an “elite” phenomenon. Professionals, including academics, are not in the habit of using computers, and prefer performing regular tasks manually. Those who are skilled in computer use are often regarded highly by their peers. Resulting from this is a commonly held perception that only experts can design good computer-related products: this perception is often perpetuated by software programmers using technical jargon to explain simple procedures.

One of the key findings of the needs analysis phase is that there exists a huge diversity in the ICT skills of the target users. The usability testing showed that the existing interface was designed for people with sufficient experience of using the web. However, we found that most students had little or no experience of using the web; hence, they needed a lot of guidance in understanding how to navigate the site and find information. Furthermore, there exists a conflict between the needs and expectations of various groups, and what AKU-IED can provide. The user group is diverse mix of male and female schoolteachers and heads from urban and rural South Asian, Central Asian and East African countries. All these countries have their own unique social, religious and cultural practices that might impact the way people approach learning through technology. An added dimension is the inequitable access to technology resulting in a wide range of computer experiences among users. Majority have English as their third or fourth language. In addition, many are severely disadvantaged economically. A deeper understanding of all these differences will have to be central to the development of a website that is economical, yet based on sound educational principles, and is engaging and stimulating for the audience.

### ***Sustaining user engagement in the design process***

The engagement of users in designing curriculum or training programs is a familiar strategy at AKU-IED. However, engaging wide spectrum of target users in the website design process is a new phenomenon. Reich et al. (1996) suggests that effective participation requires continuous commitment. Our experience has alerted us to two possible challenges: Firstly, how to engage a wide spectrum of faculty members; Secondly, how to ensure their continuous engagement in the design process.

Initially, I found the faculty members hesitant to participate in the design process. Some were of the view that they were not “good with technology” (T1); while others felt that a team of “experts who have evaluated a range of e-learning environments” (T4) is needed to propose a suitable design for OL website. The opinion seemed to be that users either do not know what they want or will not be able to express their needs.

While, this perception may have implications for the acceptance of the final design by those not part of the UCD process, the experience shows that users, including those who had never seen a website before provided deep insights into user interaction with computers, and alerted us to the diversity of needs among the target audience. Similarly in cases where faculty members were not able to articulate their needs, the team was able to identify gaps in their existing knowledge of how technology can be used for teaching and learning. These insights would not have been possible without a diverse group of users.

Another observation was that majority of the faculty-workshop participants were young, techno-savvy (McKenzie, 2003) and have recently returned from studies abroad with one exception of an Associate Professor, who is also engaged in technology integration. In addition, since I had personally discussed the UCD idea prior to the workshop, it is difficult to specify whether it was genuine interest in the project or a feeling of obligation that motivated the participants to come to the workshop. It is clear that strategies will need to be incorporated to sustain the momentum in the long and tedious design process. Possible strategies include, informing users about the developments through an on-going electronic discussion and engaging different sets of users at different stages of design. However, it is yet to be seen whether the competing priorities, growing workloads and limited appreciation of technology in education will allow senior academics sufficient time for a UCD process.

### **Rethinking usability**

The needs analysis phase also indicates that the notion of usability, as conceptualised in the western contexts, is not an easy one to be translated in the context of a developing country, where Internet is not ubiquitous. For instance, data shows that the OL website had high usability value for a group with sufficient technology background and familiarity with AKU-IED's educational context. However, the same website had extremely poor usability value for a group that had no prior experience of using the web, and was not familiar with AKU-IED's teaching and learning context. Thus, usability attributes cannot be universally applicable. Also, they are not static attributes of the interface. It seems more appropriate to view usability as a relationship between the users, and the system engaged in an activity within a given context. Usability will change with the change in user, the system, the context, the activity being performed or any combination of these. Thus, in order to design usable interface, there is a need to develop a greater understanding of the users and the context in which the system will be used. This idea is further researched and developed during the design process.

### **Way forward**

The user needs analysis phase identifies a pattern of conflict between user needs and expectations and AKU-IED's own capacity to meet those needs. Like many other educational institutions in developing countries, AKU-IED a non-profit teacher education institution, has resource and budget constraints. Another aspect that we need to consider during the design phase is how ready the users are to adopt the use of web in their existing practices. These factors are likely to be central in determining the shape of the final design. Accordingly, we have enter the design phase with a realization that the final design will have to be one that balances users' needs, expectations and what is feasible.

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