Iterative Usability Evaluation for an Online Educational Web Portal

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ABSTRACT

Online education is a popular paradigm for promoting continuing education for adult learners. However, only a handful of studies have addressed usability issues in the online education environment. Particularly, few studies have integrated the multifaceted usability evaluation into the lifecycle of developing such an environment. This paper will show the integration of usability evaluation into the development process of an online education center. Multifaceted usability evaluation methods were applied at four different stages of the MU Extension web portal’s development. These methods were heuristic evaluation, focus group interview and survey, think-aloud interviewing, and multiple-user simultaneous testing. The results of usability studies at each stage enhanced the development team’s understanding of users’ difficulties, needs, and wants, which served to guide web developers’ subsequent decisions.

Keywords: Continuing Education, E-Learning, Online Education, Usability Evaluation, Usability Testing, User Centered Design, Web Portal

INTRODUCTION

Online education is the most popular delivery mode of today’s distance education. Online education employs multimedia products to improve the effects of teaching and learning and allows learners to participate in various class activities without the boundary of geographic location and time (Richardson & Swan, 2003). This particular form of pedagogy fits well with the increasingly busy lives of learners, especially adult learners who have great motivation to...
learn but are highly constrained by space and
temporal conditions. As such, the landscape of
online education is ideal for the promotion of
continuing education for adult learners.

Extension units at land-grant universities,
a critical arena for expanding higher education,
provides a range of scholarly and professional
services to state citizens, communities and
industries (McLean, 2007). Nowadays, an
increasing number of university extension units
have adopted various web-based technologies
to deliver educational program content, training
workshops, credit or non-credit courses, and
online degrees to adult learners in order to fulfill
students’ lifelong learning objectives. University
of Missouri Extension (MU Extension), a
branch of the land-grant University of Missouri
System, is one of these successful examples
providing Missourians with a wide range of
educational opportunities, informational
programs, and materials that are based on university
research. In addition, this organization has also
employed the distributed learning strategies
that use the internet to disseminate educational
materials, news stories, video releases, online
courses, and reviewed publications in multiple
program areas such as agriculture, community
development, human environmental sciences,
business development, youth development and
continuing education.

A great deal of research has been conducted
to examine the effect of online education within
formal educational settings (e.g., Bannan-
Ritland, 2002; Jeong & Joung, 2007; Oh &
Jonassen, 2007), while insufficient research
has been carried out within professional
development or informal learning environments
where educational information and programs
pertaining to the occupations of adult learners
are offered. To date, much attention has been
given to the design of online learning environ-
ments (e.g., Remidez, Stam, & Laffey, 2007;
Scardamalia & Bereiter, 1994) and the potential
of online learning to promote collaboration (e.g.,
Johnson & Johnson, 2008). However, only a
handful of studies have addressed usability of
the online education environment (e.g., Ardito et
al., 2006; Parlangeli, Marchigiani, & Bagana,
1999; Saade & Bahli, 2005). Particularly, few
studies have integrated the multifaceted usabil-
ity evaluation into the lifecycle of developing
such an environment.

Usability evaluation is vital to a web
development team because developers must
consider how major users, such as learners and
educators, navigate through a web system to
accomplish the tasks that lead to teaching and
learning. If developers fail to consider the real
users’ needs and interaction behaviors, learning
will be impeded because users’ working
memory is taxed with unnecessary cognitive

This paper describes the design challenges
and the usability evaluation that was incorpo-
rated into the development process of an online
continuing education center -- the MU Extension
website. The MU Extension website had grown
exponentially and chaotically since the first web
pages were posted in the mid-1990s. Existing
MU Extension websites did not meet the require-
ments for an ideal educational environment for
learners and extension educators due to the
lack of understanding of real users’ needs. For
instance, links and pages were added based on
the internal organization of MU Extension rather
than logical, content-based organization catego-
ries. To better serve the users of the site, the MU
Extension web team intended to establish a new
web portal that provided a centralized access
point to a series of educational materials. The
Information Experience Laboratory (IE Lab)
of the University of Missouri worked closely
with the web team and employed multifaceted
usability evaluation methods at four different
stages of developing this web portal: heuristic
evaluation (Phase I: prototype), focus group
interview and survey (Phase II: initial design),
think-aloud interviewing (Phase III: detailed
website design), and usability testing (Phase
IV: website build).
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