A Heuristic-Based Re-Evaluation of the IBM Academic Initiative Project Interface

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Introduction

The IBM Academic Initiative Project is an online resource for educators to discover and download course-related software. The present interface utilizes two systems for cataloging materials; the Repository acts as warehouse for thousands of pieces of available software, and indexes them via in-house IBM designation codes (i.e., B5143); while the Courseware site presents software under groupings of specific teaching-topics. This divided system presents significant usability issues; the Repository's size hinders timely identification of particular software, while the Courseware site can only present a fraction of the accessible choices and may therefore omit the educator's most useful option.

In partnership with IBM our team applied usability heuristics developed by Schneiderman (1998) and Nielson (1990) to this online portal. Once candidate violations of these frameworks were identified, a mockup of each site was created with interface modifications designed to enhance both objective and subjective performance measures. These changes included:

- the adoption of a search tool (to subvert unnecessary menu-driven searches and eliminate the necessity of recalling titles),
- removal of superfluous information (such as date-of-production, internal designation codes, and truncated summaries),
- and inclusion of individual landing pages complete with direct download hyperlink (for feedback purposes).

Methods

36 undergraduate students (equally divided by gender) were recruited. Average age was 21.9 years. Additionally, to provide context for real-world performance goals, we recruited 6 professors from UCF's Departments of Psychology, Computer Science, and Engineering and asked them (via a questionnaire) how long they would devote to searching for a particular piece of software before giving up (average: 203 seconds).

Participants were placed in one of two counterbalanced groups. The first group received the IBM original version of the Repository, and our Courseware mockup with interventions. The second group received our Repository mockup, and the IBM original version of the Courseware site. Each participant experienced two trials in which their goal was to find a particular piece of software (that we identified for them via verbal prompt and written card). Objective measures included time-to-completion (TTC: time from page-presentation to arrival-at-target) and success rate (whether or not the software was retrieved within the faculty-designated time-window). The study was a 2 INTERVENTIONS (Mockup vs. Original) x 2 SYSTEM (Repository vs. Courseware) mixed design. Participants' subjective experiences were gauged using the Mouloua Usability Questionnaire (MUQ) (Rivera et al., 2010).

Results

Our interventions had a positive effect on completion time, reducing it by a full minute on average. It is important to note that our mockup of the Repository incurred its own performance decrement, and so these gains were likely larger than represented. Further, these interventions led to a 34% increase in successful task completion (i.e., more educators reaching their target software before giving up).

In terms of subjective experience findings, participants rated the UCF Courseware site as easier to use, easier to learn, less frustrating and stressful, and more consistent. Moreover, they felt the UCF system facilitated task completion to a greater extent, and they expressed greater willingness to engage with the system again.

Discussion

Based on usability literature, our team developed user-centered interventions for the Courseware site. Interventions were designed to increase usability and decrease TTC by facilitating the discovery of target software. Our mocked-up courseware site with interventions was (on average) a minute faster. These improvements were put in context of a 203 second criterion (drawn from professors' responses), and the result was a 34% improvement in the number of potential downloaders who found their target.

Overall, participants' subjective responses indicate they consistently preferred the IBM repository site to the mocked-up version; most likely due to the restrictions we faced in its replication. However, regarding the Courseware site to which we made purposeful and meaningful modifications, participants consistently considered the UCF-generated site as a better system (as gauged by numerous subscales).

In sum, our recommended interventions represent a substantial improvement. Some limitations, including design tradeoffs, may mean the true extent of the improvement is still unknown. In light of this, implementation of some or all of our interventions is suggested, and subsequent A-B testing on actual web traffic advised. We also give more general recommendations and lessons learned for practitioners liking to conduct heuristic evaluations of their own.
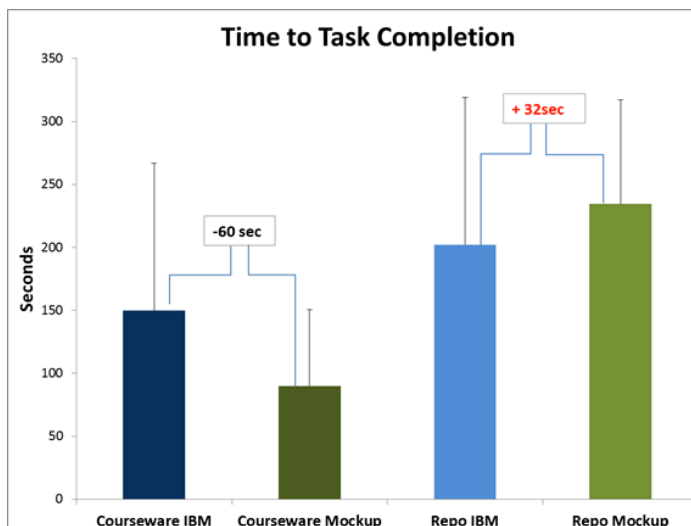

Figure 1.   Mean differences in seconds for participants on each site to find target pieces of software.
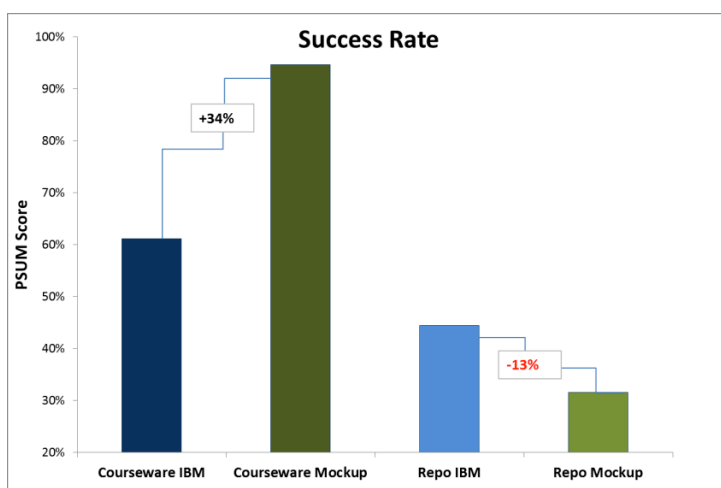

Figure 2.   Comparison of projected success rates between sites, based on a 203 second (3 min, 23 sec) criterion drawn from professor feedback.

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Acknowledgements

References

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