

Using Eye Tracking as a Tool to Teach Informatics Students the Importance of User Centered Design

Helene Gelderblom, Department of Informatics, University of Pretoria, South Africa

Funmi Adebesein, Department of Informatics, University of Pretoria, South Africa

Jacques Brosens, Department of Informatics, University of Pretoria, South Africa

Rendani Kruger, Department of Informatics, University of Pretoria, South Africa

ABSTRACT

In this article the authors describe how they incorporate eye tracking in a human-computer interaction (HCI) course that forms part of a postgraduate Informatics degree. The focus is on an eye tracking assignment that involves student groups performing usability evaluation studies for real world clients. Over the past three years the authors have observed how this experience positively affected students' attitude towards usability and user experience (UX) evaluation. They therefore believe that eye tracking is a powerful tool to convince students of the importance of user centered design. To investigate the soundness of their informal observations, the authors conducted a survey amongst 2016 HCI students and analysed student course evaluation results from 2014 to 2016. The findings confirm that students regard the eye tracking assignment as a mind altering experience and that it is potentially an effective tool for convincing future IT professionals of the importance of usability, UX and user centered design.

KEYWORDS

Eye Tracking, Group Assignments, Human-Computer Interaction Curriculum, Usability Evaluation, User Centered Design

INTRODUCTION

Human-computer interaction (HCI) concepts such as usability and user experience (UX) have become an accepted part of information technology (IT) systems design. Including these concepts in information systems development methodologies is regarded as beneficial to the perceived usefulness, ease-of-use, and quality of software solutions (Karat, 2005; Shneiderman, Plaisant, Cohen, Jacobs, Elmqvist & Diakopoulos, 2016) and may consequently lead to improved user satisfaction, user adoption and loyalty (Van der Heijden, 2004; Weinschenk, 2005).

In line with reports from Europe (e.g. Cajander, Eriksson & Gulliksen, 2010 and Ardito, Buono, Caivano, Costabile, & Lanzilotti, 2014), South African organisations have been slow in their adoption of usability and UX design and evaluation as a crucial aspect of the software development process (Pretorius, Hobbs & Fenn,

DOI: 10.4018/IJICTE.2017100109

2015). Although HCI is taught at most tertiary institutions in South Africa and hence the IT professionals produced by these institutions should have knowledge of HCI techniques and principles, there still seems to be a shortage of these skills. The question arises why the students who are taught HCI and subsequently fulfil roles of business analysts and IT project managers do not enforce HCI principles in the design and development of their IT products (Beukes, Gelderblom & Van der Merwe, 2016; Pretorius, et al., 2015).

A possible reason could be that the way they were taught about these aspects did not make a large enough impression on them to consolidate the principles in their mental knowledge base on systems design. To learn about and be assessed on usability, UX and interaction design principles from a primarily theoretical perspective and through traditional lecture based teaching practices may not be the best approach for students to internalise this knowledge. An alternative approach would be experiential learning (Kolb & Kolb, 2005). When students experience first-hand how users struggle, how different users approach the same interface differently and how their own biases come into play, they will really appreciate the value of proper user evaluation.

Incorporating real user evaluation experience into an HCI course is challenging. Some of the difficulties we have had to deal with are:

- User evaluation requires specialised skills in observation, data recording and data analysis which are acquired over time and through practice.
- Translating the results of the evaluation into design recommendations is a skill acquired through experience.
- Assessment of student performance is time consuming, since they have to be observed while doing the evaluations.

To address these problems we designed an extensive UX and usability evaluation assignment that postgraduate Informatics students do by performing eye tracking experiments over a period of four weeks. Eye tracking provides a structured way of collecting user data (Poole & Ball, 2006) and with the correct eye tracking software to do data analysis, students can do this with a limited amount of instruction. The study that we report on in this article set out to establish whether our aim with this assignment – to convey to students the importance of UX and usability in IT systems design – has been fulfilled, especially from the point of view of the students. The specific question we address is: How does incorporating practical eye tracking experience into the Honours Informatics HCI curriculum impact students' perception of HCI concepts such as usability evaluation and user centered design?

Over the past three years we have observed a positive effect of the assignment on students' attitude towards usability and UX evaluation. It is clear from the formal course evaluations as well as from informal verbal reports that most students are interested in the topic and enjoy doing the eye tracking assignment. This led us to believe that eye tracking could be a powerful tool to persuade students (and consequently future IT professionals) of the importance of usability, UX and user centered design. To test this proposition, we conducted a survey amongst the 2016 HCI class and report on the results in this paper. These results are complemented by an analysis of the student course evaluation data from 2014 to 2016.

Before we give the details of our course and the way we incorporate eye tracking into the syllabus, we provide a survey of the related literature. Then, after describing our use of eye tracking to teach HCI, we explain our methods for investigating the success of our approach and finally discuss the results and conclusions.

OVERVIEW OF RELATED WORK

The Lack of Adoption of Usability Practices

There is some evidence that business and project managers have doubted the reliability of usability and UX designs and evaluations. This is because they are often based upon so-called UX experts' subjective

13 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the product's webpage:

www.igi-global.com/article/using-eye-tracking-as-a-tool-to-teach-informatics-students-the-importance-of-user-centered-design/187024?camid=4v1

This title is available in InfoSci-Journals, InfoSci-Select, InfoSci-Select, InfoSci-Select, InfoSci-Journal Disciplines Library Science, Information Studies, and Education, InfoSci-Select, InfoSci-Select, InfoSci-Educational Leadership, Administration, and Technologies eJournal Collection, InfoSci-Select, InfoSci-Select, InfoSci-Select. Recommend this product to your librarian:

www.igi-global.com/e-resources/library-recommendation/?id=2

Related Content

The Two Most Important Competencies for Millennium Teachers

Thomas Lapping (2009). *Encyclopedia of Distance Learning, Second Edition* (pp. 2168-2170).

www.igi-global.com/chapter/two-most-important-competencies-millennium/12047?camid=4v1a

Technology-Literate School Leaders in a 1:1 iPad Program and Teachers' Technology Self-Efficacy

John M. Hineman, Tiffany T. Boury and George W. Semich (2015). *International Journal of Information and Communication Technology Education* (pp. 68-79).

www.igi-global.com/article/technology-literate-school-leaders-in-a-1-1-ipad-program-and-teachers-technology-self-efficacy/123350?camid=4v1a

Supporting Informal Interaction in Online Courses

Juan Contreras-Castillo, Jesús Favela and Carmen Perez-Fragoso (2004). *E-Education Applications: Human Factors and Innovative Approaches* (pp. 235-247).

www.igi-global.com/chapter/supporting-informal-interaction-online-courses/8956?camid=4v1a

Open and Distance Learning for Sustainable Development in Bangladesh

Monira Jahan, Md. Arif-Uz-Zaman, A. N. M. Tofail Hossain and Shamima Akhter (2018). *Optimizing Open and Distance Learning in Higher Education Institutions* (pp. 40-70).

www.igi-global.com/chapter/open-and-distance-learning-for-sustainable-development-in-bangladesh/183413?camid=4v1a