Chapter 19

In the Eye of the Beholder:
Teaching User-Centered Design to Information and Communication Technology Students With the Help of Eye Tracking

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ABSTRACT

As the use of information and communication technology (ICT) solutions become more embedded in our everyday lives, ICT graduates are required to design and develop solutions that are not only easy to use, but evoke overall positive user experiences. The incorporation of human-computer interaction (HCI) principles, such as user-centered design (UCD), usability, and user experience (UX) into the design of ICT solutions can positively influence the success of deployed solutions. However, developers of ICT solutions, especially those from developing countries, have been slow to apply these principles in their development practices. Some of the reasons for this slow pace include lack of experienced practitioners due to limited number of universities offering HCI courses, especially in African countries, lack of consensus on the measures of UCD effectiveness, and little appreciation of the benefits of incorporating these design principles into development processes. This challenge is compounded by ineffective teaching strategies, in situations where HCI courses are taught. The application of an experiential learning strategy can go a long way in addressing the gap between the concepts of HCI, UX, and UCD that is taught in the classroom and their application by ICT graduates in the work environment. In this chapter, the authors describe how they incorporate eye tracking technology in an 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. They posit that eye tracking is a

powerful technology to convince students of the importance of user centered design. They conducted a survey amongst HCI students and analyzed student course evaluation results over a period of 3 years. The findings confirm that students regard the eye tracking assignment as a mind-altering experience and that it is potentially an effective technology for convincing future ICT professionals of the importance of usability, UX, and UCD.

INTRODUCTION

Upon entering the industry, information and communication technology (ICT) graduates are increasingly expected to not only design, develop and deliver functional information technology (IT) solutions, but to also build systems or solutions that are easy to use and evoke positive experiences for its users (Bruun, Larusdottir, Nielsen, Nielsen & Persson, 2018). Human-computer interaction (HCI) concepts such as usability and user experience (UX) have become accepted quality measures of IT systems and solutions (Rivera, Becker & Olsina, 2016). User centred design (UCD) is frequently mentioned as a way to achieve improved usability and UX (Mao, Vredenburg, Smith & Carey, 2005; Brhel, Meth, Maedche & Werder, 2015). Several scholarly works on the benefits and challenges of conducting UCD in industry can be found in the literature (Følstad, Law & Hornbæk, 2012; Mao et al., 2005; Ogunyemi, Lamas, Adagunodo, Loizides & Da Rosa, 2016; Ardito, Buono, Caivano, Costabile & Lanzilotti, 2014). Some of these benefits include improved usefulness and usability of developed products, and long term savings on total development costs (Ardito et al., 2014; Mao et al., 2005). The challenges associated with incorporating UCD practices into development process relate to lack of consensus on the measures of UCD effectiveness, limited appreciation of the importance of UCD and consequent resistance to its adoption and lack of experienced practitioners (Følstad et al., 2012; Mao et al., 2005; Ogunyemi et al., 2016; Ardito et al., 2014).

Although software development organisations were initially slow to adopt UCD, it is receiving progressively greater recognition as a useful and vital part of the software development process (Ogunyemi, Lamas & Eze, 2018a; Ji & Yun, 2006). ICT graduates are increasingly being required to develop usable ICT to address ever changing business problems and opportunities (Saulnier, 2016). The need for ICT graduates that are well equipped to contribute positively in a real world business environment meant that university educators must adapt their teaching strategies (Pretorius & Hattingh, 2017) and in the context of HCI, an understanding of and competence in UCD principles, methods, and tools have become necessary for ICT practitioners in industry and a requisite part of ICT curricula (Talone, Basavaraj & Wisniewski, 2017).

Although HCI coursework has been established as a customary feature of information systems and computer science academic programmes at many tertiary institutions across the world (especially those from developed countries), there is apparent shortage of these skills in industry (Henneman, Ballay & Wagner, 2016). A logical question is why ICT students who are taught UCD as part of their HCI curriculum or ICT qualifications, fail to transmit these principles and practices to industry and sufficiently fill the supply/demand gap with respect to UCD skills among ICT practitioners. 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

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