Chapter 2

Ask and You Will Receive:
Training Novice Adults to use a PDA in an Active Learning Environment

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ABSTRACT

Even though the effective usage of mobile devices has become a mandatory requirement in many professional and private areas, inexperienced users face especially great difficulties in acquiring computer skills. Based on the assumptions of constructivist learning theories, the effect of asking questions and repeated practice on PDA skill acquisition in adults (n = 36) was examined. Learners had the opportunity to ask questions and receive answers during the learning process. One learner group additionally received a manual with basic PDA-operating-principles; a control group received no instructional support at all. As dependent variables task effectiveness, efficiency, subjective ratings of perceived ease of use as well as number and content of questions were assessed. Findings showed that asking questions and repeated practice considerably enhanced PDA-performance in adult novice learners, but not perceived ease of use. Furthermore, the content-analysis of learner questions gave valuable insights into information needs, cognitive barriers and mental models of adult learners, which can contribute to the design of interfaces and computer-based tutors.

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INTRODUCTION

In the last few years, Information- and Communication Technologies (ICT) have proliferated into most professional and private areas (Shiffler, Smulders, Correia, Hale & Hahn, 2005). Parallel to the increasing diffusion of ICT, the technology itself has changed rapidly. In the 1980s, stationary PCs were predominantly used; the 1990s were characterized by the Internet and a worldwide information access. Nowadays, mobile communication technologies are widely spread, e.g., mobile- and smartphones, communicators and electronic organizers, which show continuously increasing rates of growth each year (Shiffler et al., 2005). Mobile devices and applications offer innovative areas of application and their effective use is not longer restricted to young and technology-prone user groups. Instead, mobile technologies will be used by broader and more heterogeneous groups, such as older or technology-inexperienced users. Also, beyond fun-, entertainment- or office functionalities, current and future mobile technologies will take over essential and vital parts of daily living, as in eHealth- or smart home technologies (Arning & Ziefle, 2008a; Arning & Ziefle, 2007a; Heidmann, Hovenschiodl & Ringbauer, 2003; Ringbauer, Heidmann & Biesterfeldt, 2003). Future mobile technologies will offer enormous potential especially for users of all ages by maintaining and enhancing social exchange and communication (e.g., email, chats) and mobility (e.g., wayfinding and travelling aids), by providing medical monitoring (e.g., blood sugar or heart rate monitoring) and serving as memory aid (e.g., a digital diary with a reminder for doctors' appointments). Up to now, mobile devices are predominantly designed to suit the demands, knowledge and cognitive abilities of technology-experienced and younger user groups, neglecting the specific demands and characteristics of adult users or those with restricted computer experience (Arning & Ziefle, 2007a, 2007b). Contrary to current stereotypes, technology-inexperienced adults express a great interest to acquire technical competencies and acknowledge the basic potential of technical devices for them (Arning & Ziefle, 2006). However, research concordantly shows that especially inexperienced and older users face greater difficulties in learning to use novel technical devices (e.g., Kelley & Charness, 1995; Freudenthal, 2001; Ziefle & Bay, 2005; Ziefle, 2008).

The structure and design of menus in a technical device is a central issue of human computer interaction research. The problem most often cited in menu navigation is disorientation and distraction from the correct navigational path (e.g., Conklin, 1987). Users get lost in a menu system, without knowing where they are, where to go next and how to get back to previous navigation routes or known parts in the menu. This especially applies to menus implemented in small screen devices. The mobile character of these devices in combination with small displays imposes considerably higher usability demands compared to large display technologies. Limited screen space is extremely problematic for providing optimized information access. Only a few items can be seen at a time and users navigate through a menu, whose complexity, extension and spatial structure is not transparent to them as it is hidden from sight. Users have to memorize the functions' names, their relative location within the menu and have to keep up orientation. Disorientation in handheld devices' menus is a rather frequent problem, especially for adult users and those with restricted computer-related knowledge and experience (Arning & Ziefle, 2006, 2007a,b). Recent studies have focused on menu navigation behaviour in hierarchical menus of small screen devices such as mobile phones (e.g., Omori, Watanabe, Takai, Takada & Miyao, 2002; Ziefle & Bay, 2004; 2005; 2006; Ziefle, Schroeder, Strenk, & Michel, 2007), but contrary to the profound knowledge about menu navigation in mobile phones and computer systems, only restricted knowledge is present regarding menu navigation in PDAs (Dorn, Zelik, Vepad-
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