Accessibility challenges with mobile lifelong learning tools and related collaboration

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Abstract. I have inspected accessibility of mobile systems in lifelong learning context. A critical view of accessibility is provided because usability standards and many current practices of mobile prototype design seem to neglect requirements like availability, asynchronous communication and consistency. New design and technology utilization considerations based on mobile collaboration models will be introduced. Author's own examples will be provided from the areas of user interface design and mobile learning evaluation.

Introduction

My original interest on accessibility issues has come up in the development of evaluation criteria for mobile learning solutions. Our role in instructing a team in a Finnish research project called DIGITAL LEARNING led to notice some inconsistencies in mobile learning material use as well as problems in collaboration within existing network independent mobile learning tools. (Syvänen et al., 2003) Furthermore, our user interface development work in MOBILEARN EU IST project has focused on adapting user interface for different informal learning situations (Ahonen, 2003) As the importance of informal learning in mobile context has been recognized, there has been research on systems which support a person's everyday learning over a lifetime.

While studying these systems for lifelong learning, Vavoula & Sharples have focused on personal learning projects and episodes. In this context they have developed criteria for lifelong learning organisers (LLOs):

- A LLO should be easily transferable between places: it should be either implemented on a device that is easy to carry and use around, or it should be designed so as to run on a single computer system and be accessed remotely, via any system.
- LLOs should be available and functional anytime, during any day of the week.
- LLOs should provide a smooth transition between learning topic areas and support the user to construct meaningful, integrated knowledge.

(Vavoula & Sharples, 2002)

To me these requirements are profound and set high demands on systems accessibility. In addition, the asynchronous communication (learner, peer, mentor) and collaborative knowledge building tasks around these LLO´s seem to require a second thought when it comes to interaction design. First I take a look at accessibility definitions and secondly view a mobile collaboration framework.

Traditional usability definition – a limited view of mobile accessibility

Usability focuses on making applications and websites easy for people to use.

Accessibility focuses on making them equally easy for everyone to use, including people with a disability. (WAI, 2003) These kinds of web centric accessibility definitions often focus on areas like multimodality and material conversions. However, in mobile collaboration context the ease of use is not necessarily even the primary demand, reachability and accessibility come before that. When Blanchard (2001) took a look at usability standards like ISO 13407 HUMAN CENTRED DESIGN PROCESSES FOR INTERACTIVE SYSTEMS, he noticed that focus is on usability and not accessibility per se and there were no statements requiring systems to be accessible. Interestingly, the latest standardisation in this mobile area have been rather late (February 2002) and it has tried to answer those accessibility challenges (see: ISO/IEC 18021, INFORMATION TECHNOLOGY - USER INTERFACES FOR MOBILE TOOLS FOR MANAGEMENT OF DATABASE COMMUNICATIONS IN A CLIENT-SERVER MODEL). When mobile tools exchanges data with other devices via a potentially unreliable or narrow communication line, as in wireless communications, user interfaces for management of database communications of mobile tools are required to meet user's needs such as fast response, high usability, reliability and easy-to-use features. Standardizing these new user-interfaces will be very beneficial and convenient for mobile users. (ISO, 2003)

Those standard based approaches mentioned above are important, still rather technical in nature and focused on information access more than collaboration needs of humans. To my mind more important is the user or community need perspective. Coming back to these learning tools and their usability requirement, Alpion (2001) states: “In reality, the educational need is not to have a computer in the hands of every student but for students to be able to access appropriate processing power, software and data as required.“ To us this remark includes a reference to old network computer concept where the all data processing takes place in a central computer. However the criteria ‘as required’ seem to be too optimistic while in reality users are suffering from unavailability and interruptions in their mobile connections. Additionally some users prefer to work in offline mode, to avoid cognitive load or for some other reason. Therefore this notion ‘as required’ seems to need some intelligence or replication logics from the tool. Ratner et al. (2001) state: “Replication is especially important in mobile environments, since disconnected or poorly connected machines must rely primarily on local resources. The monetary costs of communication when mobile, combined with the lower bandwidth, higher latency, and reduced availability, effectively require that important data be stored locally on the mobile machine. “

Mobile collaboration framework and accessibility

Churchill and Wakeford (2002, 173) have foreseen this challenge area: “Experience of mobility is embedded in an experience of temporality which includes mutually negotiated rhythms of contact, availability and accessibility.” They have suggested a following design framework for collaboration on the move with two dimensions:

1. Tight versus Loose Mobility
2. Close versus Distant Information

These dimensions of Churchill and Wakeford are likely to reveal a fact that information need in mobile settings is continuously changing from one situation to another. Providing supporting tools for this kind of operational environment is demanding while in addition to accessibility support (like through replication) also availability and contact support areas need to covered.

Future work

This mobile accessibility research continues within Ahonen’s dissertation work and prototype building within a coming R&D project. Integrating personal, group and organisational learning requirements in mobile settings will be the next challenge. The focus will be on both information systems design and human resource development system redesign.

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