
Jari Varsaluoma
Tampere University of Technology
Department of Pervasive Computing
Unit of Human-Centered Technology (IHTE)

Session: Cross-cultural viewpoints
Open symposium by IFIP TC13 & SIGCHI Finland
4.3.2015
Unit of Human-Centered Technology (IHTE) @ Tampere University of Technology

• Research on user experience (UX) of mobile and ubiquitous systems since 1990s
• Strong cooperation with industrial partners

Research topics:
• UX in smart environments
• Social user experience
• Lean UX in SW industry
• Collaboration in workplace
• Emotional impacts of technology use

See: www.cs.tut.fi/ihte
Content

• Background
• Mobile mathematics learning service
• Study 1: Culturally dependent issues in m-learning development
• Study 2: Mobile learning service user experience and user motivation
The developing world is now more mobile than the developed world.

Most phones are owned by people living in low-income regions.

Growth of global mobile subscriptions:
- 2000: 0.7 billion subscriptions
- 2010: 5.9 billion subscriptions
- Developing countries: 29% (71%)
- High-income countries: 77% (23%)

Access to a range of mobile applications has increased dramatically throughout the last decade.

 Rise of non-voice mobile usage in 2011:
- Kenya: 89%
- Mexico: 82%
- India: 49%
- Indonesia: 96%
- Egypt, Arab Rep.: 72%
- Ukraine: 72%

Source: http://go.worldbank.org/0J2CTQTYP0
Mobile learning services in different cultures

- The cultural differences between countries may shape mobile phone use practices. (Baron & Segerstad, 2010)
- Designers of mobile learning services require knowledge about the typical practices of the target cultures.
CCD MobiLe - Cross-Cultural Design for Mobile Learning (2012-2014)

- **Aim of the project**: Development of cross-cultural design practices, tools and guidelines for mobile learning solution development.

- **Focus**: The affect of culture on UX of multimodal and collaborative mobile learning services.

- **Project partners**:
  - Nokia
  - Tampere University of Technology
  - Digile
  - Tekes
Microsoft Maths (previously Nokia Mobile Mathematics)

- Free, online high school learning support service
- Provides thousands of math exercises as well as theory and tests, presented in an engaging way
- Educational resources are based on national curriculum
- Offers instant, interactive feedback
Microsoft Maths introduction
(previously Nokia Mobile Mathematics)

• https://www.youtube.com/watch?v=gdUmeyowjdQ#t=141

• https://www.youtube.com/watch?v=PQSu6tlxNkA
STUDIES
Study 1: Understanding culturally dependent issues in the design of mobile learning services

Research questions

• What cultural issues need to be considered in the design of mobile mathematics learning technology?
• What is the cultural context of mobile mathematics learning in South Africa?
Study 1: Understanding culturally dependent issues in the design of mobile learning services

Methods

• Analysis of data collected in 2008-2010 during Nokia Mobile Mathematics –pilot projects in South Africa
• 36 schools, 4223 learners (grades 9 and 10), 9 teachers.
• Data collection methods:
  – paper questionnaires, focus group interviews, observations and data logging.
• Researchers identified objective and subjective cultural issues from the data set (e.g. Aykin, 2005; Ouygi et al., 2008)
Study 1: Understanding culturally dependent issues in the design of mobile learning services

Results (Vainio et al. 2015)

<table>
<thead>
<tr>
<th>Objective issues</th>
<th>Subjective issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>The level of mobile network coverage</td>
<td>Learners’ attitudes towards mathematics</td>
</tr>
<tr>
<td>The level of mobile penetration</td>
<td>Learners’ attitudes towards collaboration</td>
</tr>
<tr>
<td>Language used at school and learners’ level of that language</td>
<td>Teachers’ attitudes towards mobile mathematics</td>
</tr>
<tr>
<td>Aligning the material content with local curriculum and level of maths</td>
<td>Teachers’ attitudes towards collaboration</td>
</tr>
<tr>
<td>Society’s school system</td>
<td>Teachers’ concerns related to mobile use in schools</td>
</tr>
<tr>
<td>Policy for mobile technology use during school hours</td>
<td>Parents’ concerns related to mobile use in schools</td>
</tr>
<tr>
<td>Access to and actual usage of the service</td>
<td></td>
</tr>
</tbody>
</table>
Questions to support the cross-cultural design of mobile learning services for school context

<table>
<thead>
<tr>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>What would be the best target age for the learning service?</td>
</tr>
<tr>
<td>What language is used at school? What language is used at home?</td>
</tr>
<tr>
<td>What is the pupils’ level of that language used at school? Does it have implications to design e.g. does more simple language need to be used in the content?</td>
</tr>
<tr>
<td>Does the content need adaptation to the local curricula and level of maths?</td>
</tr>
<tr>
<td>How to implement mobile service to the existing school system?</td>
</tr>
<tr>
<td>Who is responsible for taking the system into use, maintaining it and plan the use to be part of the school day?</td>
</tr>
<tr>
<td>What kinds of instructions are needed?</td>
</tr>
</tbody>
</table>
Study 2: Microsoft Maths user experience and use motivation

Research questions

• What motivates learners to use the studied mobile mathematics service?

• Is there a relation between the user experience, use motivation and actual usage of the mobile mathematics service?
Study 2: Remote mobile survey about user experience and user motivation

Methods

• Mobile survey integrated to the Microsoft Maths platform.
• Multichoice and open-ended questions + log data of the actual usage.
• Survey invitation visible for all users in South Africa between Dec 2014 – Jan 2015.
• Prizes: Lucky draw of five R200 free air-time coupons for mobile data.
Study 2: Remote mobile survey about user experience and user motivation

Preliminary results

- 65 responses (23 female).
- Majority (78%) used the service mainly on their free time.

When do you most often use this service?

- During school/work hours: 22%
- On my free time: 78%
<table>
<thead>
<tr>
<th>Question</th>
<th>Average</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>I like using this mobile service in studying mathematics.</td>
<td>4.75</td>
<td>0.61</td>
</tr>
<tr>
<td>(Strongly Disagree 1 – 5 Strongly Agree)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How likely are you going to continue using this service in future?</td>
<td>4.78</td>
<td>0.67</td>
</tr>
<tr>
<td>(Not at all likely 1 – 5 Very likely)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How likely would you recommend this service to your friends?</td>
<td>4.87</td>
<td>0.39</td>
</tr>
<tr>
<td>(Not at all likely 1 – 5 Very likely)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Study 2: Remote mobile survey about user experience and user motivation

Quotes from the users

I never really had a love for mathematics, however this service made me enjoy doing maths for a change… (F, 17y)

I like it because it enables learners to have fun while gaining more knowledge in mathematics through competing with fellow learners. (M, 41y)

I like using this service because it saves time, improves my psychological power, so there is no need to spend most time paging like in textbooks. It is like my teacher in the pocket because it provides both questions and answers and I can use it anywhere at any time. (M, 17y)
Thank you!

References


• Baron, N. and Segerstad, Y. 2010. Cross-cultural patterns in mobile-phone use: public space and reachability in Sweden, the USA and Japan. New Media and Society (12/1), 13-34.

• West M. & Vosloo S. (Eds.). 2013. THE FUTURE OF MOBILE LEARNING: IMPLICATIONS FOR POLICY MAKERS AND PLANNERS. UNESCO.


Contact: jari.varsaluoma@tut.fi