"Tap it again, Sam": harmonizing the frontiers between digital and real worlds in education

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Frontiers In Education Conference 2014

Opening Doors to Innovation and Internationalization in Engineering Education

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Background

Ubiquitous support for lifelong learning

“Lifelong learning is like a never ending personal revolution”

@BryanMcGill, Voice of Reason

1. No support for learning activities across locations, devices, and environments.
2. Need to link learning activities with everyday life activities, physical world objects.
Previous research

Learning spaces with mobile devices

<table>
<thead>
<tr>
<th>Activity</th>
<th>Listen</th>
<th>Watch</th>
<th>Write</th>
<th>Read</th>
</tr>
</thead>
<tbody>
<tr>
<td>Having breakfast</td>
<td>12,24</td>
<td>8,16</td>
<td>8,84</td>
<td>29,24</td>
</tr>
<tr>
<td>Cleaning</td>
<td>37,4</td>
<td>1,36</td>
<td>0,68</td>
<td>2,04</td>
</tr>
<tr>
<td>Sitting in the sofa</td>
<td>34,01</td>
<td>44,89</td>
<td>50,34</td>
<td>62,58</td>
</tr>
<tr>
<td>Having lunch</td>
<td>11,56</td>
<td>10,88</td>
<td>8,84</td>
<td>20,4</td>
</tr>
<tr>
<td>During coffee/time</td>
<td>19,72</td>
<td>11,56</td>
<td>27,2</td>
<td>38,77</td>
</tr>
<tr>
<td>Watching TV, during time</td>
<td>12,92</td>
<td>15,64</td>
<td>32,64</td>
<td>47,61</td>
</tr>
</tbody>
</table>

In my room

<table>
<thead>
<tr>
<th>Activity</th>
<th>Listen</th>
<th>Watch</th>
<th>Write</th>
<th>Read</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waking up in the morning</td>
<td>18,36</td>
<td>2,72</td>
<td>7,48</td>
<td>25,84</td>
</tr>
<tr>
<td>Getting dressed</td>
<td>19,72</td>
<td>0,68</td>
<td>1,36</td>
<td>2,04</td>
</tr>
<tr>
<td>Sitting at my desk</td>
<td>37,41</td>
<td>29,92</td>
<td>51,69</td>
<td>54,42</td>
</tr>
<tr>
<td>Lying on bed anytime</td>
<td>34,69</td>
<td>34,01</td>
<td>33,32</td>
<td>50,33</td>
</tr>
</tbody>
</table>

Figure 4. Learning activities in context with mobile devices. Percentage of individuals.


Mobile Authoring of OER

Literature Review

Why on NFC?

Zero Clicks / Natural Interaction
Radio Frequency Identification
- Unidirectional
- Few meters

Near Field Communication
- Bidirectional
- 3 inches (aprox. 7 cm)

Evolution
- First RFID enabled phone (2007)
- iPhone 6 (2014)
Literature Review

Search terms

- Terms:
  *(NFC learning mobile)*
  OR
  *(RFID learning mobile)*

Literature review

Traditional face-to-face classroom

1. Distributing materials
2. Enriching printed materials
3. Bind to multimedia content
4. P2P between devices
5. Delivery of materials
6. Integration social networks
7. Control lab materials
8. Examinations. ID cards

Beyond the classroom. Guided tours

Fig. 2. Adaptive user interface.

Kuflik et al. (2011)
Literature review

Access control

Harmon hospital implements RFID to track assets:
• ID cards
• Real time unauthorized access alert to clinical staff
• Instant messaging

Wearables

Bacheldor, B. (2006)

Corchado et al. (2008)
Literature review

Smart Home

Logistics

Gárate et al. (2005)

Ting et al. (2011)
Literature review

Activity Recognition

• Location
  o Kitchen
  o Dining room...

• Object
  o Dishwasher ...

• Time

Simulation of strategies & scenarios

Yang et al. (2011)

Kubicki et al. (2011)
Seamless Learning Across Digital and Physical Worlds

NFC LearnTracker. Goal definition

Seamless Learning Across Digital and Physical Worlds

NFC LearnTracker. Self-regulation with learning analytics
Seamless Learning Across Digital and Physical Worlds

Feedback & Ambient Learning Displays

Seamless Learning Across Digital and Physical Worlds

Thanks!

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Call for Contributions:
Seamless Learning Experiences Workshop
13th World Conference on Mobile and Contextual Learning
November 3 - 5, 2014 / Kadir-Has University, Istanbul, Turkey
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References