Appropriate Pedagogy and Learning with Mobile Phones

Mike Sharples
Institute of Educational Technology
The Open University, UK
Mobile devices used by Open University students to access course materials
As mobile technology becomes widespread, the emphasis shifts from access to... 
... what kind of learning do you want to achieve?
<table>
<thead>
<tr>
<th>Learning by...</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Changing behaviour</td>
<td>Behaviourist</td>
</tr>
<tr>
<td>Enhancing skills</td>
<td>Performative</td>
</tr>
<tr>
<td>Acquiring information</td>
<td>Receptive</td>
</tr>
<tr>
<td>Gaining knowledge</td>
<td>Constructivist</td>
</tr>
<tr>
<td>Making sense of the world</td>
<td>Situated</td>
</tr>
<tr>
<td>Interpreting reality in a different way</td>
<td>Collaborative</td>
</tr>
</tbody>
</table>
Behaviourist learning

• Shaping behaviour
  – Personal health, diet, social behaviour, financial behaviour

• Important but difficult
  – Change attitudes -> modify behaviour -> reinforce changed behaviour patterns
  – Mobile technology to reinforce changed behaviour *in situ*

“Expand early childhood care and education: The goal calls for better and more possibilities to support young children, and their families and communities, in all the areas where the child is growing – physically, emotionally, socially and intellectually”
**Glo-yo**

*University of Nottingham*

- An interactive toy that teaches children how to wash their hands properly.
- Mobile hand washing device shaped like a ‘yo-yo’
- Designed in collaboration with young children
- One side contains lotion for washing hands
- Other side has UV light to detect where lotion has not been washed off, and images showing 6 steps to wash
- A one-year trial saw a sustained improvement in hand washing.
- Manufacturing agreement with Ravencourt Ltd
Performative learning

• Enhancing skills
  – Science, engineering, sport, music, social interaction

• Developing a combination of skilled activity and meta-cognitive awareness
  – How to perform the skills
  – Understanding when to apply the skills
  – Self-evaluation of the outcomes

“Promote learning and life skills for young people and adults: This goal places the emphasis on the learning needs of young people and adults in the context of lifelong learning”
Personal Inquiry

• Three year project
• University of Nottingham/ Open University
• Aim:
  – To help children to become scientists, by developing their skills of effective science investigation
Myself

Healthy eating

Fitness and heartrate

My Environment

Effect of noise pollution on birds

Food packaging and decay

My Community

Urban heat islands

Micro-climates

Personally meaningful investigations
Inquiry toolkit

- Calculator
- Timer
- Camera
- Audio recorder
- Accelerometer
- Location tracker
- Tilt sensor
- Communicator
- Anemometer
Record a daily food diary

### Breakfast
- Bread: Brown - 3 slices
- Meat: Red - 1 portion
- Peas, beans, lentils
- Egg - 2 portions

### Lunch

<table>
<thead>
<tr>
<th>Food</th>
<th>Portion Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vegetables</td>
<td>1 portion</td>
</tr>
<tr>
<td>Meat: White</td>
<td>1 portion</td>
</tr>
<tr>
<td>Egg</td>
<td>2 portions</td>
</tr>
<tr>
<td>Peas, beans, lentils</td>
<td>1 portion</td>
</tr>
</tbody>
</table>

### Dinner

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbohydrates (g)</td>
<td>136</td>
</tr>
<tr>
<td>Protein (g)</td>
<td>96</td>
</tr>
<tr>
<td>Fat (g)</td>
<td>123</td>
</tr>
<tr>
<td>Fibre (g)</td>
<td>11</td>
</tr>
<tr>
<td>Sodium (mg)</td>
<td>1555</td>
</tr>
<tr>
<td>Calcium (g)</td>
<td>678</td>
</tr>
<tr>
<td>Iron (g)</td>
<td>17</td>
</tr>
<tr>
<td>Vitamin A (mg)</td>
<td>0</td>
</tr>
<tr>
<td>Vitamin B (mg)</td>
<td>8</td>
</tr>
<tr>
<td>Vitamin C (mg)</td>
<td>73</td>
</tr>
<tr>
<td>Vitamin D (mg)</td>
<td>4</td>
</tr>
<tr>
<td>Water (g)</td>
<td>512</td>
</tr>
</tbody>
</table>
For each meal – take a photo, describe the meal. Software computes nutritional content.
My inquiries > Healthy Eating > Analyse and represent my evidence

During the data analysis, you need to see your data and transform it in order to make sense of it, e.g. through different graphs, charts, etc. to help you understand relationships in data and see trends and patterns.

During this phase, you may find errors in data and so think why they occurred.

**Result Presentation**

**Graph for 19.09.2010**

**Fooddiary for 19.09.2010**

- My data
- RDI

**Compare to recommended daily intake**
Powerful tools to create new inquiries

Choose which measures you will use.

**Key measures**
- **Location**
  - Choose from: Games area, Reception, Canteen, Humanities block, Car park, Assembly hall using GPS receiver

**Selected measures**
- **Humidity**
  - A number measured in Percentage (%) using Humidity sensor
- **Image of location**
  - Upload an image using Camera

**Not used**
- **Windspeed**
  - A number measured in Radians per second (m s⁻¹) using Anemometer
- **Temperature**
  - A number measured in Celsius (°C) using Thermometer
- **Notes**
  - Text using nQuire tool

Save
Receptive learning

• Acquiring information
  – Vocabulary, number, general knowledge
• Repeated practice
• ‘Just-in-time’ information

“Increase adult literacy by 50 per cent: This goal calls for a certain level of improvement in adult literacy by 2015 – it says that it should be 50 per cent better than it was in 2000.”
Incidental vocabulary learning

- E-book: Read story for vocabulary
- Personal vocabulary: Rehearse vocabulary list
- Mobile game: Practise sentence construction

Selected words → Game words
Missing words → Selected words
One. Jobs for Today

Every day lots of different people come to Happy Hills because there are lots of exciting things to do.

Sally Brown works at Happy Hills in her holiday. She is a student and she wants to be a teacher.

“I need the money,” she tells her family, “and it’s an interesting job.” But she is always very tired in the evening.

evening noun
the part of the day before when you go to bed

Elmo wants to be a famous singer like Zapp. Can you help him to record his own CD of songs?

Drag words into the space below to tell Elmo what to do.

‘Zapp’s coming today. He’s opening the new Zapp-o-cpter,’ says William to Sally.

‘Open and do some work!’ says Mr Worm.

Sally is a singer. Sally loves listening to songs and she has all his CDs. There was a picture of him in her room too.

open verb
to move, or to move something, so that something is not closed or covered

Open the _____.
One: Jobs for Today

Every day lots of different people come to Happy Hills because there are lots of exciting things to do.

Sally Brown works at Happy Hills in her holiday. She is a student and she wants to be a teacher.

“I need the money,” she tells her family, “and it’s an interesting job.” But she is always very tired in the evening.

Welcome to L-Mo!
Product launch by Sharp in Autumn 2011

warm adjective
having a pleasant temperature that is fairly high, between cool and hot

I sat down. It was cold out in the street, but it was nice and warm in Holmes's sitting room.

Complete the sentence

'He found it in the street and ______ it here on Christmas Day for me to look at.

- brought
- listened
- ate

Correct. Well done!
Constructivist learning

- Learning by constructing knowledge
- Integrating new understanding with existing knowledge
- Need to ensure that the new knowledge is correct and meaningful

“Improve the quality of education: This goal calls for improvement in the quality of education in all its aspects, aiming for a situation where people can achieve excellence.”
Mobile Computer Supported Collaborative Learning (MCSCL): Eduinnova

- MCSCL developed by Pontificia Universidad Católica de Chile
- Wireless handheld computers
- Tested in schools, teacher training, university students
- Trials in other countries, including UK
Situated learning

• Making sense of the world
• Learning in locations
• Learning about locations
• Learning across locations
• **Context** – a central topic of research in mobile learning
Learning about locations

• Geology
  – E.g. rock formations, glaciation, erosion

• Land use
  – Forestry, farming, wind farms, footpaths

• Tourism
  – Local history, landmarks, literature
From simple mobile technology ...
... to complex
Collaborative learning

• Sharing understanding
  – Learning as conversation

• Re-interpreting reality
  – Inter-subjectivity
  – Perspective taking

“Achieve gender parity by 2005, gender equality by 2015: This goal calls for an equal number of girls and boys to be enrolled in primary and secondary school by 2005 – this is what gender parity means.”
Sharing perspectives with basic mobile phones
Anupama Roy, PhD

SMS text game for peer education of male sex workers in India
Participatory design in Kolkata, India with peer educators in the ‘males having sex with males’ community
You are at DIC. There are some SINGARA (snack) on plates. Eat SINGARA. To eat, PICKUP Singara, then USE Singara. Your mission will then be successful.

Keywords:
GO
FIND
SAY
PICKUP
USE
HELP
You are at the Park now. It’s time for CONDOM demonstration. Distribute some CONDOMS.

To accomplish, the player has to GO to the DIC (drop-in centre), PICKUP the CONDOMS, then GO to a location where there are clients, and USE the CONDOMS.
Process and outcomes of project

• Design workshops with 16 peer educators in Kolkata, and at Nottingham

• Trialled with 16 peer educators in Kolkata (some who were developers)

• Usable, relevant, entertaining

• Built a community amongst marginalised individuals.

• Most continued to use SMS – 13 were in contact three months later
“When there’s a problem in the field like from the police... I SMS the crisis management team or those I have come to know from playing the game. This game has helped a lot in this crisis management”
The 3C’s of effective learning

Construction
relating experience to knowledge, creating new ideas

Conversation
with teachers, with learners, with ourselves, and with the world

Control
actively pursuing knowledge
Mobile learning challenges

**Enable** effective 1 to 1 learning in the classroom

**Connect** learning inside and outside the classroom

**Manage** children bringing their own powerful personal technologies into school

**Support** learning through construction, conversation and control