Capturing Curiosity — Mobile Learning and the *Internet of Things*

Engaging students in meaningful learning experiences requires significant effort and it can be disheartening when this is not reciprocated. Conversely, when students' curiosity is aroused, educators are often not able to respond immediately to their enquiry, or students decide that it will require too much effort to pursue it. As a result, many personal learning opportunities are lost. Recent developments in multimedia technology provide a myriad of ways to capture and present learning material. However, in a curiosity driven scenario, the content must be accessible without delay.

The *Internet of Things* (International Telecommunication Union, 2005) concept involves physical objects being tagged with URLs to websites giving access to information about them. As McAndrew (2008) highlighted in *Bulletin 24*, Quick Response (QR) codes are a common type of 2D barcode optimised for mobile phones with a built in camera (as an alternative means of data entry, on which the user can then initiate a desired action (Biever, 2006).

Having become aware of this technology, I considered how it might be used to facilitate learning. It became apparent that due to the relatively limited screen resolution of mobile phones (at that time), they would be better suited to presenting audio information and hence would have an application in promoting access to learning. I was successful in obtaining funding under the JISC TechDis HEAT (Higher Education Assistive Technology) Scheme to develop a prototype. The project was presented at *Ed Media 2008* and full details are available in the proceedings paper *(Thin, 2008)*.

The aim of the project was to test the use of 2D barcodes attached to objects that students interact with. Then through decoding of the URL contained in the QR code, a request is made from the Wi-Fi enabled mobile phone to a media server, to play the audio file pertaining to the object. The compact size of the phone means that they are readily portable and can be operated as a standalone wireless network without requiring any additional network infrastructure (Figure 1).

The setup was tested by a student with a visual impairment using a collection of models of human bones and joints labelled with 2D barcodes. They were very positive about the availability of information in audio format and its immediate availability on demand. They could see how such technology would enable them to become a more independent learner. It was also demonstrated to small groups of students who had taken the anatomy module the previous year. Not only were they very impressed with the setup, but they were enthused by the potential to enhance learning.

The project demonstrated a practical working solution of the original concept and the utility of the solution to be an enabling technology for students with visual impairment so that they can become more independent learners. Furthermore, the described approach significantly widens the scope for student-centred, enquiry based learning for all students in a wide range of learning environments.

Subsequent to the completion of this project, the wide range of technology now available including wireless portable media players, touch screen mobile phones and ultra-mobile PCs means that device limitations to the above approach have all but been eliminated.

References

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Figure 1. Illustrating the process of using 2D barcodes attached to objects, linked to audio files.