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Personal Inquiry: Lessons Learned

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The paper describes a school trial in secondary to school to explore how version 1 of the PI Toolkit helped students to perform a personally relevant scientific inquiry in a science classroom and at home. Over a three-week period (nine lessons), twenty one 13-14 year old students in an inner city school participated in an inquiry to answer the question "how healthily do I eat?".

The lessons were structured around an Inquiry Guide, reflected in the design of the toolkit and the lesson plans. The Inquiry Guide designed to align with the aims of the inquiry, shaped by the teacher's need to work within a specific vocabulary and by the style of her teaching. It specifies activities that take place during an investigation such as data collection, and analysis, and highlights the iterative nature of inquiry – a simplistic stage-like progression is replaced by an iterative one where phases are repeated until students achieve satisfactory outcomes. For example, if students collected data and try to analyse it but subsequently realised their data set is inadequate, they can go back to data collection phase and collect more data until they can pursue their analysis.

The PI Toolkit guided students through the complex process of carrying out their inquiry. It provided adaptive navigation (available options change in the light of student's actions) through the phases of inquiry including past, current and future activities. . The Toolkit was implemented in Drupal, an open source CMS, accessed through a browser using a combination of pre-existing and custom built modules. It was run on a local web server installed onto an Asus EEE ultra mobile PC. In addition to this we gave the students a digital camera in order to record what they ate.

A variety of measures were taken to explore how the toolkit was used by students to inform subsequent redesign of the system; this included multiple video tapes from classroom and teacher and students interviews. These were used in a critical incident analysis of learning breakthroughs and breakdowns (Sharples, 1993; Anastopoulou, 2008) to derive design guidelines that resolve challenges for implementing personal inquiry learning. Three themes have emerged,

1. **Co-ordination across contexts:** These are pragmatic issues when trying to connect school activities with activities outside the classroom. For example, students were initially enthusiastic about taking the technology home but became bored with carrying it around , with the result that crucial technology or information was not always available

2. **Co-ordination within contexts**: Apart from designing activities to support the transition from one context to the other, it is also important to facilitate technology-mediated activities within the school or home context.

3. **Revealing identity:** For the students to undertake work beyond classroom settings, it needs to be engaging and personally relevant. But, an activity that is too personally revealing can cause embarrassment, leading to reluctance to share the results, or even capture the data. This has serious implications for student's learning.

These resulted have provided a number of concrete design proposals for both the pedagogy and technology which will be incorporated into the next iteration of the PI Toolkit and are likely to have relevance to other researchers interested in support inquiry learning across multiple contexts.

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