Personal Inquiry: linking the cultures of home and school with technology mediated science inquiry

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Description

The Personal Inquiry (PI) project is investigating ways to help young people aged 11-14 to understand themselves and their world through a process of active scientific inquiry across formal and informal settings. The children use new methods of Scripted Inquiry Learning, implemented on ultra-mobile PCs (UMPCs) and classroom technologies, to gather and assess evidence, conduct empirical research and engage in informed debate. Their activities are based around topic themes e.g. 'myself', which are in line with key elements of the new 21st century science curriculum (Millar & Osborne, 1998). This paper refers to the experiences of working with an inner city school in Nottingham where pupils were given a UMPC and a camera to use at home, for a period of three weeks. The educational aim was to help students pursue an inquiry into how healthy is their diet, with the students describing and photographing what they ate for a few days. This was supported through an 'inquiry guide' implemented on the UMPC that followed the structure of their relevant science lessons. Nine science lessons were structured around the following inquiry activities: find a focus, decide on the inquiry questions, plan the investigation, collect data on daily eating, import it on a special software, convert it into nutrients, compare their nutrients to a recommended nutrient intake, draw inferences, prepare a presentation, present it and finally reflect on it.

A large pool of data has been collected, consisting of lessons' video recordings, log files, interviews with the teacher and pupils, questionnaires and observation notes. This paper mainly focuses on data coming from pupils' interviews but based on the teacher's accounts and our observation notes, overall, pupils' generally succeeded in collecting meaningful data outside the class, displaying it in a meaningful diagrammatic way (with the aid of the technology), drawing conclusions based on their data, and sharing their understanding with the class.

The school undertaking the study does not normally set homework for its students. The science teacher we are working with, in particular, views homework as a set of extension activities that motivated students might do. Homework however has multiple instructional purposes such as a) to practice or review material that has already been presented in class, b) to introduce material to help students obtain the maximum benefit when the new material is covered in class (preparation assignments), c) involves the transfer of previously learned skills to new situations (Extension homework), d) to integrate separately learned skills and concepts by using book reports, science projects, or creative writing (Cooper et al., 2006). As a result, the provision of technology to take

home could be seen as an opportunity to improve not only academic achievement but also the degree of engagement to school-related tasks.

Bearing these in mind, after each of the first four lessons, pupils were given the task of recording their food for a day as homework. Another homework task was to complete activities that did not finish in the class. They could also extend their inquiry activities, e.g. by carrying out an online search on healthy eating. From the children's perspective, even a simple task as taking photos was a challenge and the fact that they brought photos back to the class was a success in itself. However it was not a task easily achieved. In particular, some pupils were hesitant to take photos of what they ate and sharing it with the class. Based on interviews, this was due to forgetfulness, embarrassment or lack of interest. Taking photos of what they eat is distant from their routines so for example, some said that they would not remember to carry the camera with them when eating out. Additionally, since the pupils come from a relatively deprived socio-economic background, pupils were self-conscious of what they eat. During group interviews with pupils, it was often said that food looked disgusting when in a photo or that it was not healthy. Furthermore, most pupils were reluctant to share their food with the rest of the class. When asked, they mentioned that people in the class would want to know whose meal it was so that they would ridicule them. It took pupils a few lessons to realise that they would not be required to share their photos with the class or the researchers.

There were two particular instances that motivated pupils to bring photos from home: 1. when relating their food to the recommended nutrient intake (for their age group) and 2. when preparing their presentations. These instances were critical in that pupils could not proceed in the investigation unless they completed the part they were responsible for. That is, they could not draw inferences about their diet unless they collected personal data of what they ate, and they could not present their investigation unless they had drawn inferences. Furthermore, as the intervention progressed, more pupils became engaged, while those remaining disengaged faced the danger of standing out by not doing it.

Apart from taking photos, technology at home was used for various activities, including playing games (online or embedded in the machine), web browsing and social networking. Based on data from pupils' group interviews during and after the intervention, there were pupils that also used the technology for inquiry based activities such as

- catching up with previous lessons activities, especially when they missed a lesson
- finishing off what they did in the class,
- preparing their presentations
- accommodating feedback they took from presenting their investigation.

Pupils attitudes towards the technology shifted during the course of the investigation. At the beginning, pupils were excited to take the technology home and play with it. Towards the end of the investigation, however, some pupils seemed bothered by the chore of carrying it back and forth. They complained about the lack of a place to store the equipment while in the school premises (but outside the science class). It was difficult for them to carry it around during breaks and they were also under pressure to share it with other school children which they did not like.

Based on pupils' accounts, the perspective of the family during the investigation resembled pupils' attitudes to the project. At the beginning, family members appeared to be supportive: they reminded pupils to take photos; a pupil also mentioned that their parent took dinner photos on their behalf. As the investigation progressed in time, however, some families complained to the students about the

length of the investigation. Pupils mentioned comments like: ‘are you still doing this?’ or ‘there is no point of doing it if nobody else is doing it’.

These issues offer opportunities for understanding pupils experience with technology mediated science inquiry. They sometimes suggest simple ways to support them, e.g. by providing a storing space while in school. In some cases, support is more challenging: how to involve more parents in their homework or how to increase the time for engaging in inquiry activities are still open issues. They are explored and are going to shape the iterative design decisions for the PI toolkit and inquiry activities.

References

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