Taking Literacy Beyond The Classroom

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Abstract: We report on a project that demonstrates how fieldtrips can be structured and delivered in novel ways, and how they can extend the range of curricula that can be addressed – in this case to literacy. After describing a fieldtrip to support creative writing, which employed UbiComp technologies, we focus on how outcome and process were affected, and how working with a mobile device was perceived in comparison to working with worksheets on traditional fieldtrips.

1 Introduction

New technology is enhancing learning in a number of ways. Handhelds, wireless and pervasive computing have been used in classrooms, together with sensors, RFID tags and augmented objects etc. to enhance learning [2, 5, 7]. At the same time, new technology allows learning to move outside the classroom. Of course this is nothing new. Fieldtrips are a long-used technique for letting children engage with and explore an environment. New technologies can extend and enhance this teaching technique. Typically, fieldtrips concern science, history and geography. They are often task-based, involving searching, identifying and counting where checklists or sets of questions structure and guide the learning [8]. Recently, fieldtrips have been augmented with mobile technologies to enable new kinds of interactions. These range from providing children with various portable devices to explore and gather data about the ecology of a woodland without specific predefined activities [6], to allowing children to 'write digital graffiti' onto locations in a city centre [1], supporting project-based learning. We here report on a project that demonstrates how fieldtrips can be structured and delivered in novel ways, and how the range of curricula that are usually addressed can be extended – in this case to literacy and creative writing.

A major skill to be taught in primary school is literacy, concerning the abilities of reading and writing. Literacy skills are developed over the six years of primary education in a number of ways including creative writing, storytelling and narrative. In our project (conducted in collaboration with the Universtiy of Southampton) we created a fieldtrip for Year 5 children from Whiteley Primary School, UK. The fieldtrip involved the children exploring the grounds of a historic English country house, Chawton House. Working with the curators of Chawton House as well as senior staff from Whiteley Primary School, we created a fieldtrip that had children interact with this environment to gather data, ideas and inspiration for a piece of creative writing: a story. We were keen

to explore how a real setting, with a range of historical characters and stories attached to it, could work as a resource for exploration and inspiration, feeding into creative writing, and supporting literacy education in new ways. We here focus on how outcome and process were affected, in particular how working with a mobile device was perceived in comparison to working with worksheets on traditional fieldtrips.

2 The Fieldtrip

The literacy fieldtrip was designed and provided in partnership of our team with staff from Chawton House and two senior teachers from Whiteley Primary School. Our team ran a first fieldtrip with six children in summer 2005. The system consisted of PDAs that can deliver and record audio and text. These were linked to a location-sensing architecture, using GPS augmented by RF beacons. People walking around the estate thus would hear and see information depending on where they were. They furthermore could record audio and text.

The teachers first decided upon the overall structure and nature of the fieldtrip. They then designed questions, instructions and prompts, asking children for example to listen to a docent's audio clip about a particular location or to record an improvised dialogue between historical characters. They also provided timings and sequencing of instructions. The research team assisted with overviews of available audio clips from tour docents and explained what options the technology provided. In [4] we describe the co-design process with teachers and curators.

Before leaving for Chawton House from school, the children were given an introduction to the devices. After arrival, a curator took the children on a (non-augmented) tour of the house, telling them about important features and encouraging reflection on e.g. how the owner family or their servants would use a particular part of the house. Next, the children moved outside, forming three pairs. With one PDA per pair, they explored the grounds, free to go where they wished, given prompts by the system. The purpose of this second phase was to familiarise children with the grounds, finding out facts and stories, to observe the surroundings, and to inspire their imagination. At the end of this phase the children

Figure 4: (top): Exploring the grounds and focussing on a location; (bottom): note-taking using old and new technologies;

in a fast pace had explored most locations, engaging in a range of activities. A typical sequence at one location would first play an audio clip about the woodlands in the garden being made to look like a wilderness, then ask the children to search for a place that they find scary and to describe it in their own words. In the last phase each pair went to two locations to conceptualize their stories, thinking about character, setting and plot. This phase was slow-paced and had less variety in activities. Instructions prompted children to spend five to ten minutes reflecting and noting ideas, e.g. on what events might happen in this location. The following day, the children wrote their stories up at school in the computer lab.

Researchers with a video camera accompanied each pair. Directly after the fieldtrip we interviewed the children individually. The following day we observed them writing their stories, and then carried out a group interview with them, plus an interview with the teachers. Video from all activities was transcribed and the data analyzed qualitatively.

2.1 A variety of Interactions and Stimuli

The instructions and prompts had children engage in a variety of interactions with each other, the device and the environment. They were finding out facts about the grounds, hypothesizing about the meaning of things, gathering sensory impressions (sights, sounds, smells), and role-playing characters that might have passed through the gardens. The children were exposed to a range of stimuli, some physical and some digital, receiving prompts and questions, using both text and audio. Here we give one example:

Liz and Becky walk through the lime avenue leading onto a big lawn and facing Chawton House. Becky, looking at the device, remarks "This is Lime Avenue". She reads the instruction aloud: "walk towards the house and notice the small window". While walking she reads "imagine someone looking through one of these windows. Think who it might be: why are they looking out; why are they in this room? Make a brief note of your ideas". Liz (walking) takes her notebook and scribbles. She points to the house "there's a small window there". Becky repeats "Think who it might be". Liz responds "one of the Knights" and Becky agrees "yes, maybe one of the Knights".

Here, the children's interaction with the environment in terms of their movement through it and the direction of their attention is choreographed by the system. The instruction asks them to connect the house with the grounds, and to imagine a reversal of perspective, someone looking out of the window. The children integrate previously learned facts (about the Knight family) into the current situation, and interact with each other to develop responses and ideas. In other sequences (for a more detailed discussion see [3]) we see them collaborating in discussing the atmosphere of a location, hypothesizing and imagining, moving on as each child notices different things.

3 Changing Outcome and Process

Teachers found the fieldtrip highly successful in terms of the results of the creative writing activity. Analysis of the stories shows that all the children engaged in a synthesis

of factual, historical and anecdotal data grounded in a real setting, with imaginative extension reinterpreting this data to serve character, setting and plot. Teachers emphasized that the children moved beyond the kinds of events, characters, and settings they would normally write about and thereby extended their repertoire. The children were just as enthusiastic about how the environment had inspired their writing. Basing a story on a real setting both eased having "a clear picture of what the whole thing looks like" and imagining what story protagonists might do. One of the children told us: "As soon as you got there, you went through the gate, you had an idea come out in your head straight away. (…) When you went there, you could, if you imagined the story, or the setting, in your head, you could see a picture of all the parts, and you could just imagine your character like walking along and doing an activity there."

Both children and teachers extensively commented on the difference between the kinds of fieldtrips they were already familiar with, and this one; and how using the PDA differed from the traditional worksheet on a clipboard. The teachers were particularly pleasantly surprised about the effects of timing and sequencing that resulted from using the PDAs. "Because it was given at regular intervals or fed into them when they were perhaps in certain locations, it paced, it gave pace to the day, instead of the children setting the pace". They agreed that the use of the technology has "slowed them down" and enabled them to focus on the activities. With a worksheet and clipboard some children "would whizz through questions: it becomes a race, who can get things done quicker." With a worksheet, children can see all questions at once and jump from one to the other. With the PDA giving prompts one after the other, the experience was less predictable and children needed to complete a certain task before proceeding to another. This facilitates children "who wouldn't normally get things done" to focus on and complete activities. Thus, even though teachers did not accompany and direct children in person, they had increased control over the structure of children's activities through the prompts appearing on the devices and how they were sequenced and timed. Besides sequencing, they could define a maximum time for an activity after which the children would be sent a reminder to 'finish this activity' and could have the next prompt follow with a delay, explicitly allowing for open-ended exploration in-between the designed activities.

Being able to go about on their own, without direct supervision, gave children a great sense of freedom even though they were aware that they were supposed to engage in a given exercise. Ben told us: "You've got a feeling that you're alone, 'cause there's nobody coming round; you can not necessarily do what you want, but you can just feel a bit more relaxed". Mollie indicated that worksheets on fieldtrips could lead to a feeling of restriction: "we had a sheet which said 'go to this place and do this, this and this'. It didn't let you go wherever you want, like we did today, and then tell you what you could do when you were at a certain place". Being able to choose the order of locations to visit and being prompted by the system only upon arrival seemed to enhance their sense of discovery, and led to their experiencing the device as helpful: "we didn't know where we were exactly, and then it just came up with this thing, information on the Library Terrace, and we went 'Oh that must be where we are'". Another child explained: "What the device did was, it showed us where things were, what things were about". The children further found that the device provided them with more information than they

could ever get from a clipboard: "the device was basically like all the knowledge that ten people could learn". They particularly enjoyed the diversity of audio clips, emphasizing that there were different voices. Besides carrying more information, the device was experienced as light and compact, handy to carry around and work with. In contrast, the worksheets on a clipboard could fly away when it was windy and were described as "a bit fiddly, (…) especially when you have to turn them over and find something".

4 Conclusion

In this paper we have shown how UbiComp, in 'moving beyond the desktop', can enhance known educational techniques (here, fieldtrips) and successfully extend these into new areas of curriculum (here, literacy), by involving children's bodies and movements as well as their minds. We have discussed changes in product and process which are useful and valuable in terms of educational goals, here literacy skills as developed through creative writing. We employed mobile devices to direct children's creative discovery and structure their engagement with a historic setting, inspiring their writing. Interesting side-effects of our system were how much children enjoyed the freedom that the devices provided them with, how the sequencing of instructions paced children's interactions and supported them in focusing on one task or location at a time, and the differences they perceived in comparison to worksheets on clipboards.

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