Supporting Family Collaboration with Shareable Technology

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Shareable technologies are technologies designed to support co-located collaboration. In this research we used the Diamond Mystery to explore how we can use such technology to support the meaningful participation of all family members, of different ages and abilities, in working together to solve a problem.

Previous research

Radziszewska and Rogoff (1991) describe guided participation as 'a collaborative process involving joint structuring of activities with participation by both partners in the thinking process' and an important aspect of children's learning from collaboration with adults and peers. However, in situations where adults do not have previous experience, e.g. a scientific reasoning/experimentation task, parents have been observed to miss opportunities to help their children learn, often delegating logistical roles to children and assuming the more difficult conceptual tasks such as recording data and making inferences themselves (Gleason and Schauble, 1999). We are interested in how a combination of shareable and individual technologies might mediate parent/child interactions, especially as in other domains technology has been found to cause a reversal or flipping of traditional roles and to mediate intergenerational communication (Harley 2009).

board view

There has been a diamond theft at the Ritz Jewellery Shop downtown. We need your help to solve the mystery...
The Diamond Mystery is a collaborative game, played around our DiamondTouch interactive tabletop computer. Teams of 3 amateur detectives (family groups consisting of a parent and two children between the ages of 9 and 17) move around the digital board (left) and collect clues which are sent to their personal handheld devices (iPods). These clues then need to be shared with the other detectives in order to solve the mystery of the missing diamond. A multi-user concept map is provided to help them share (right).

concept-map view

Data collection and analysis

Quality of solution
Each group was given a score for how good a solution they came up with at the end of the game

Post-game questionnaire
Participants were asked to rate their enjoyment of the task, how much they felt they participated and about a number of facts that came up in clues in the mystery to measure how well they shared these with each other.

Video analysis
Observations were made from video recordings of families playing the game
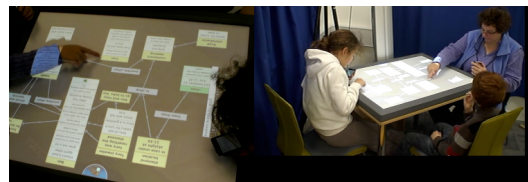
Findings so far

• Only 2 of the 5 families got the correct solution, but all families generated plausible solutions by the end of the game, fairing as well if not better than adult only groups performing the same task.
• As in previous research, we found that the technology did cause switching of traditional roles, with many examples of children supporting their parent's technology use.
• Whilst parents maintained overall authority in the game, they were happy to allow older children to take charge of playing the game. Parents (and often older siblings) were observed to play a positive supporting role: encouraging everyone to participate and contribute, explaining or clarifying confusing information, making suggestions and reasoning out loud– all aspects associated with 'guided participation'.
• Having access to own handheld devices, own clues necessary for the solution of the problem and equal access to the tabletop to record clues did ensure everyone participated in the game.

• However - there was much frustration observed in two families where there was a younger and older sibling (9 and 12, 12 and 16) where it was felt the younger sibling was not able to manage the task, resulting in both cases with the older sibling taking the younger sibling's iPod. Therefore, rather than encouraging more equal participation, parents and older siblings in these families felt the technology and task configuration hindered their progress, making it more difficult for them to encourage the younger sibling's participation at an appropriate level, and upset the younger sibling who was made to feel their contribution was not welcome.
• Further analysis will look more closely at sharing and support processes employed within families, considering the technology role in mediating these.
• All families thoroughly enjoyed the experience - even the younger siblings!