

Supporting peer collaboration in the classroom through novel technology

The ShareIT project

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On the ShareIT project we are systematically testing the potential of new, shareable technologies to support children's co-located collaboration in ways which go beyond the traditional desktop computer. Shareable technologies include innovations such as multi-touch tabletop displays, large screen interactive whiteboards and tangible devices. These are all tools that allow several people in the same place their own input (e.g. multiple mice or touch display) and the chance to interact at the same time on a shared task.



A traditional computer set-up with a single keyboard and mouse allows only one child to control the technology at any one point while others look on. This often leads to frustrations and collaborative discussion can move quickly away from problem-solving toward issues of control and negotiation of turn-taking. This type of design is more conducive to individual rather than to group work.

Providing children with technology that allows more equitable participation such as multi-touch input and face-to-face rather than side-by-side interaction should have a positive effect on the nature of their collaborative interactions. However there is no consistent evidence directly comparing the collaborative benefits of different shareable interfaces for primary-aged children.



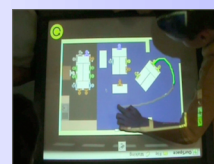
In the first of a series of planned studies we are evaluating the use of a digital touch tabletop display for supporting collaborative activity in the classroom. Groups of 3 children can work together around the table each using touch to interact with the display. We have observed 34 groups of children between 7 and 9 years old undertaking a planning task around the table. The task involves planning a seating layout for a fictitious class. Children are presented with a scale floor plan of their current classroom and given three pieces of information about each member of the fictitious class, who they are told may use their classroom in the future; their level of talkativeness, whether they have good or poor eyesight and their friendship groups. Children then have to lay out the tables and allocate each class member a seat.



We began by using a paper prototype to evaluate the task before developing the digital application called OurSpace.

All children found the task highly engaging and we observed high levels of productive collaborative interaction in both paper and digital conditions.

We believe the physical set-up of the task which allows children to face-to-face interaction and equal access and input afforded the high quality of discussion we observed.



The paper prototype sessions highlighted the difficulty children had with conceptualising the classroom floor plan as a 3D space.

OurSpace allowed children to draw walking trails around the classroom which helped them understand the plan as a representation of 3D space.

We are currently analysing the data from the two digital conditions; single-touch and multi-touch input. In a parallel study with adults conducted at the Open University, results suggest that the multi-touch input condition was more conducive to productive interactions than single-touch input as physical participation was more equitable (Marshall et al, 2008). However, little work has addressed how children manage interactions which involve simultaneous input from a number of participants. Early indications from our study suggest that while the single touch condition was more frustrating, for the younger children in particular it appeared more conducive to maintaining shared attention for the task than the multiple touch condition. We are particularly interested in making further age comparisons which take into account communication abilities in order to extrapolate when and for whom shareable technologies may be most useful in the classroom.

References:

Marshall, P., Homecker, E., Morris, R., Dalton, N. S., and Rogers, Y. (2008) When the Fingers do the Talking: A Study of Group Participation with Varying Constraints to a Tabletop Interface. To appear in Proceedings of IEEE Tabletop '08, Amsterdam, 1-3 October.

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