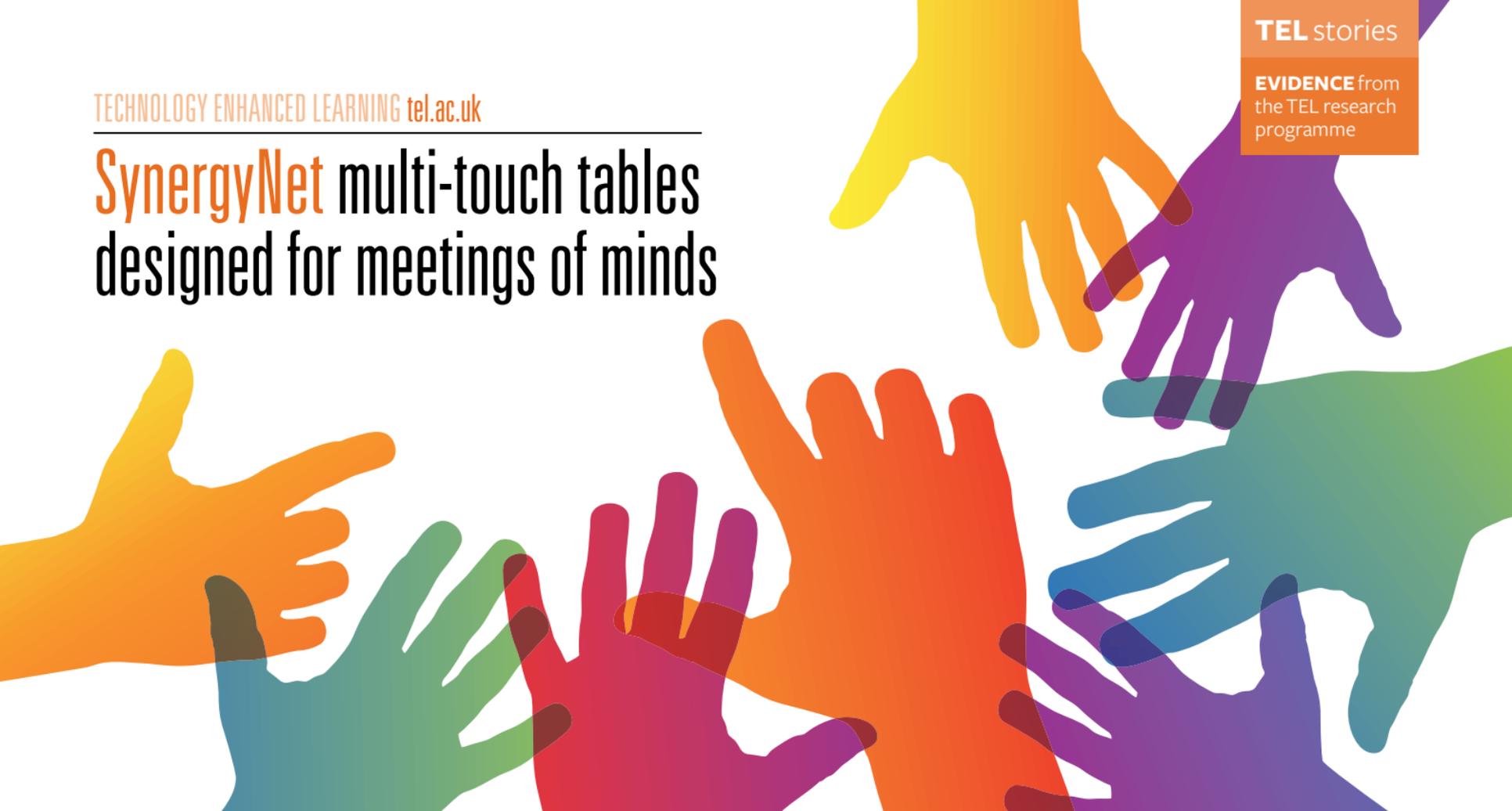


TECHNOLOGY ENHANCED LEARNING tel.ac.uk

SynergyNet multi-touch tables designed for meetings of minds

TEL stories

EVIDENCE from
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programme





Picture all the really fascinating things a group of children can do clustered round a classroom table. They can discuss a story, examine an object, work out how to do a sum, learn from each other's work. Now imagine what more they could do if that table were like a giant multi-touch iPad, able to interact with them all equally. That's SynergyNet.

Professor Elizabeth Burd, principal investigator, SynergyNet project.

SynergyNet... the challenge

Everyone knows about the 3Rs. But what about the 4Cs? Generally regarded as essential to success in the 21st century, they are communication, creativity, critical thinking... and collaboration.

Good teachers excel at encouraging effective group work in the classroom. But it's not just important for promoting learning at school. The computer industry, for example, is desperate for people who can work together. Huge pieces of software, far too much for a single person, have to be coded collaboratively.

Paradoxically, schools often struggle when it comes to collaboration involving technology. Children sit in rows in front of their computers, working alone. Any attempt at group work usually ends up with one child commandeering the mouse, leaving everyone else passively watching. Even an interactive whiteboard makes group collaboration challenging.

The SynergyNet team wanted to change that. A group of Durham University computer scientists, psychologists and education

researchers, they believed that technology could promote and enhance traditional classroom collaboration rather than stifle it.

In 2008, with the aid of a £1.2 million grant from the ESRC and the EPSRC research councils, Professor Elizabeth Burd and the rest of the team set out to make that vision a reality.



...the challenge

SynergyNet... SynergyNet allows teachers to monitor the tables remotely, oversee the children's work and share it between groups.

SynergyNet... the technology

A traditional classroom laptop is far too small, awkward and fragile to help primary pupils work together. There will always be children who can't see the screen or who insist they don't mind reading upside-down writing. Then there's the vexed question of who gets to type. And what if they're just too young to use a mouse and keyboard?

SynergyNet's answer was to start with the concept of a touchscreen tablet computer. They enlarged it so that four or five children could gather around it, then they laid it flat and then they attached legs.

Using touch and gesture-based technologies, they designed the huge screen so that it could recognise up to five users, eradicating all those wrangles about who's in charge. Then they sorted out 'orientation independence' so that everyone can see what they need to see – the right way up.

Such 'fair and equal access,' is, for Professor Burd, the project's director, 'the essence of SynergyNet. It's vital that everyone round the table is able to perform the task set by the teacher.'

But the researchers didn't stop there. They made four multi-touch tables and networked them, so that material displayed on one can be slid with a finger on to another. This allows children to see each other's work if they are on the other side of the classroom, or, of course, the other side of the world.

The team also considered the teacher's role. If a teacher intervenes in a group, there is a risk that collaboration breaks down as pupils focus on the adult rather than on their work. So SynergyNet allows teachers to monitor the tables remotely. They can oversee the children's work, change it, pause it, modify it and share it between groups.

And they may soon be able to control the tables with just a wave of the hand. SynergyNet is currently experimenting with Microsoft Kinect devices that respond to gesture. The aim is to make it as easy as possible for teachers to integrate the tables into their classroom collaborations.



SynergyNet... Working together on the tables gives children a space to share and externalise the problem-solving process.

SynergyNet.. in action



Nearly 500 young people have put the multi-touch tables through their paces. Many have successfully collaborated to solve mysteries, such as what caused a mining accident. Working together on the tables, manipulating text and diagrams, gives them a space to share and externalise the problem-solving process.

Pupils have also experimented with NumberNet – an application designed by the SynergyNet team to encourage collaboration on maths problems. The results have been impressive. Being able to work together and share strategies has made them more flexible in their approach to maths.

SynergyNet relies on a 'social pedagogy,' says Professor Burd. 'It uses the process of collaboration where individual children, through having to explain their work to others, improve the depth of their understanding.'

The ease with which teachers can control the tables is also paying dividends. By selecting and projecting one table's work for the whole class to discuss, teachers can raise the level of pupils' thinking and reasoning.

The multi-touch tables are also giving children a better understanding of the nature of group work. The hope is that, ultimately, this will help them become better collaborators, ensuring that they have at least one of their four Cs.

SynergyNet... find out more

More information about SynergyNet is available at www.tel.ac.uk. The project is part of the Technology Enhanced Learning (TEL) research programme. This is...

- a £12m programme funded by the UK ESRC and EPSRC from 2007-2012;
- designing and evaluating systems to advance our understanding of learning and teaching in a technological context;
- supporting eight large interdisciplinary projects;
- working to achieve impact for emerging research results;
- mapping progress on key themes.

communication, creativity, critical thinking... and collaboration.

...in action



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