Case Study: Distributing Knowledge

*How A Distance Learning Project Expands the A-Level Further
Mathematics Program at University of Manchester*

The aim of the project was to widen Further Mathematics provision through effective
distributed teaching and to improve the tools, technology and methods used for remote
course delivery, by conducting the teaching of A-level Further Mathematics utilizing
inSORS Grid technology to a local school that does not possess sufficient resources to
offer it themselves.

The Problem:

A-Level Further Mathematics is a program that is optionally taken by the brightest Math
students in schools at age 16-18. Many schools in deprived areas lack the resources to
provide this program and so the University of Manchester offers this tuition as part of its
community involvement work. Math Department tutors drive to such schools to give
instruction. This helps the school and the students but it also helps the University because
of the opportunity to see the brightest students and encourage them to come to
Manchester.

Because tutors travel long distances to provide tuition, it results in high costs and time
wasted and the number of students exposed to A-Level Further Mathematics is limited.

The Idea:

By developing a distance learning program for A-Level Further Mathematics, students
from a wide range of schools are exposed to A-Level Further Mathematics without tutors
needing to drive to each school.

For a collaboration effort like this to work, the instruction needed to be as effective as
face to face. Further, an important teaching method in Math that would have to be
seamless would be the ability to effectively share material on a whiteboard between
instructors and students.

A successful pilot project would form the basis for further course delivery by the
University. The main goal was to develop a wider base of participation by local schools
and their students.

The Project:

Some attempt had been made in the past
to use conventional videoconferencing,
but it had proved inadequate. From
experience in other fields, the inSORS
Grid and underlying technology, as an
advanced videoconferencing system,
was likely to be far more appropriate. As
well as offering valuable material over

IG in Action

A tutor works at the whiteboard
at the University of Manchester
with a student at Carlton Bolling

the inSORS Grid, the proposed project also spent some effort in analysing the tools and methods used in order to identify areas for improvement. The most pertinent example is the use made in Mathematics of blackboards as a discussion tool. In discussions between mathematicians, it is normal to share in the process of writing and erasing on a blackboard in a fluid and interactive way. The project experimented with several different interactive whiteboards (including IG Whiteboard) in an inSORS Grid environment to determine whether these met the needs of Mathematics teaching.

The Results:

The project succeeded in delivering an effective course to steer students through their study up to and including the final examination. InSORS Grid (supplemented by some face-to-face time) was found to be a highly effective method of delivery and was used fortnightly for around 2 hours a time for a period of several months.

In terms of using the whiteboard to teach new concepts, the technology that proved most effective was Mimeo Virtual Ink, which converts a normal whiteboard into a smartboard. The most effective solution for highly interactive shared discussion of mathematical ideas over a whiteboard was IG Whiteboard (integrated as standard with inSORS Grid). This was employed with tablet PC's operated by both student and tutor.
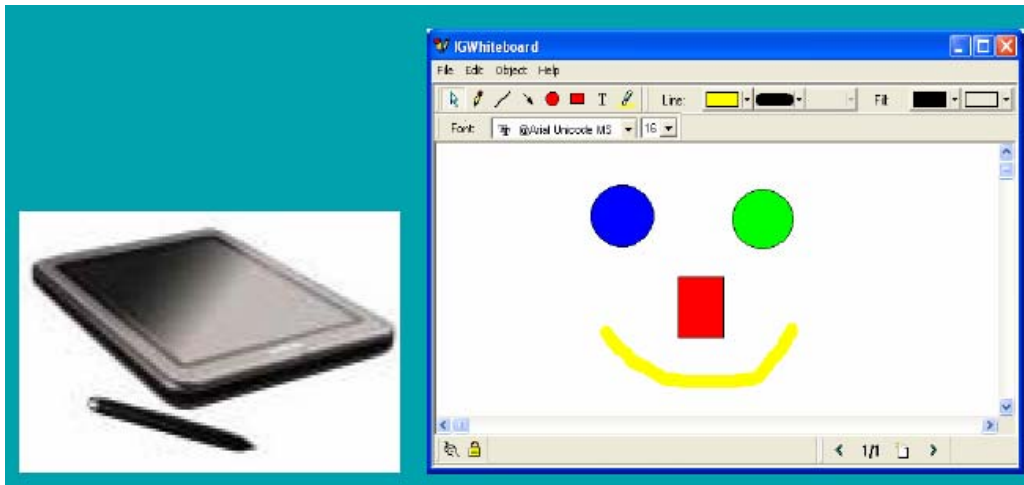
Project Partners
Distributed Learning Team, University of Manchester
Manchester Computing, University of Manchester
School of Mathematics, University of Manchester
Carlton-Bolling College & Carlton-Bolling City Learning Centre, Bradford
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Project Team
Michael Daw, Project Manager (Collaborative Working Team, Manchester Computing),
michael.daw@manchester.ac.uk

David Hume, Coordinating Body Member (Distributed Learning Fund),
david.hume@manchester.ac.uk
Bill Lionheart, Coordinating Body Member (School of Mathematics),
bill.lionheart@manchester.ac.uk
John Begg, Coordinating Body Member (School of Mathematics),
j.begg@manchester.ac.uk
Samina Ali, Tutor (School of Mathematics), s.ali-7@postgrad.umist.ac.uk
Javier Gomez Alonso, Technical support, evaluation & development (Manchester
Computing), javier.gomez-alonso@manchester.ac.uk
Ben Chalcraft, Technical coordinator (Carlton Bolling City Learning Centre),
Ben.Chalcraft@carltonbolling.ngfl.ac.uk
Celia Mulqueen, Pupil liaison (Carlton Bolling College), mulq3@aol.com
Richard Gunson, Manager, Carlton Bolling CLC,
richard.gunson@carltonbolling.ngfl.ac.uk