University of BRISTOL

Graduate School of Education

Research Briefing No. 10

Teaching Mathematics: Developing innovative use of ICT in secondary schools

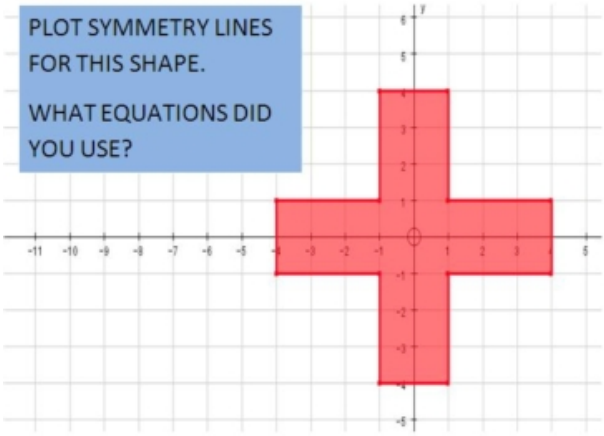
Key findings

The key element of this project involved prospective teachers of mathematics taking video recordings of their own teaching, in a lesson when they made use of ICT. The taking of video recordings was an effective tool to support:

- prospective teachers learning from effective practitioners of the use of technology.
- prospective teachers making innovative use of ICT in lessons.
- prospective teachers developing awareness of the potential for the use of technology in their future teaching.
- pupils making good progress in lessons taught by prospective teachers.
- school based mentors developing their repertoire of skills in relation to working with prospective teachers.

At the end of the project, 96% of prospective teachers on the Mathematics PGCE judged the course as “Very Good” or “Good” in terms of preparing them to teach ICT effectively.

The use of video recordings of lessons has now become an integrated part of the PGCE Mathematics course. All students take recordings of themselves using ICT in school, as one of their M-level assignments, and reflect on evidence of pupil progress. The project has also supported trials in four other PGCE subjects at the University of Bristol, aimed at developing effective use of ICT.



The research

We work with a wide partnership of schools as part of our PGCE course. There are named teachers in schools (Associate Tutors, or ATs) who are responsible for supporting and mentoring the PGCE students. In this project we worked with mathematics ATs and PGCE students in seven schools to trial and evaluate activities involving technology-based teaching. ATs, PGCE students and university tutors met as a group, initially to collect together resources for the use of a specialist programme. These resources were compiled in a booklet and sent to all PGCE students. The PGCE students from the 7 trial schools were supported (by ATs) in planning and video recording one or two lessons in which they made use of Autograph. The research group met to watch clips from the video recordings of lessons and to share learning points, which were then disseminated to the wider PGCE mathematics group.

We would like to thank the Teacher Development Agency for funding this project as well as all the schools, mentors and prospective teachers involved.

We used the programme Autograph (Chartwell-Yorke) who kindly supplied licenses to our PGCE students.

References

Coles, A. (2013). Using video for professional development: the role of the discussion facilitator. Journal of Mathematics Teacher Education, 16(3), 165-184.

Jaworski, B. (1990). Video as a tool for teachers' professional development. Professional Development in Education, 16(1), 60–65.

van Es, E., & Sherin, M. (2008). Mathematics teachers' ''learning to notice'' in the context of a video club. Teaching and Teacher Education, 24, 244–276.

Research design

The seven trial schools engaged in a mini action research project, which involved school-based mentors and prospective teachers jointly planning to make use of ICT in a lesson, video record the lesson and then reflect on evidence of pupil progress during that lesson. These projects were supported by two group meetings at the University.

Edited clips of lessons were shared with the research group. These lessons formed the basis for evidence of pupil progress in lessons. We took progress to be indicated by a student doing something at the end of the lesson they could not do at the start.

Laurinda Brown interviewed three of the school based mentors involved in the project and these interviews were analysed for similarities and differences and gave evidence for the learning of mentors.

Prospective mathematics teachers (not just in the research group) completed a questionnaire about their learning (in relation to ICT and other issues) from the PGCE course.

Further information

A significant issue in using video for teacher learning, is developing an effective way of working when viewing the recordings. There is a consistent research finding that it is common for discussion of video to become generalised and evaluative, leaving little opportunity for learning (van Es and Sherin, 2008).

On this project we followed a way of working on video that was developed at the Open University (see Jaworski, 1990). This method involves selecting a small clip (~3 minutes long) and beginning discussion with a detailed reconstruction of what was said or done (avoiding all interpretation and evaluation) and only then moving to offering thoughts *about* what was on the recording. We used this method both with prospective teachers and mentors, when sharing video clips and found it was effective in shifting discussion away from evaluation. More detail about the method can be found in Coles (2013) about what is involved, as a facilitator, in using this way of workin

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