‘Exploring the effects of using (Assessing Pupil Progress) materials’ on teaching in mathematics and science

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WHAT IS THE BACKGROUND TO THE RESEARCH?

The research is a small scale study investigating mathematics and science teachers' attitudes to and use of the Assessing Pupils’ Progress (APP) materials and the changes, if any, that these materials have made to their practice. APP materials were devised and introduced to schools in England during 2008/2009 as part of Government policy, by National Strategies’ consultants. It provides a framework for teacher assessment in English, mathematics, science and ICT, from the primary stage of schooling through to the end of Key Stage 3 (age 14), and is rooted in the English National Curriculum. The then DSCF claimed that the use of APP would promote Assessment for Learning (AfL) and lead to improvements in teachers’ curriculum planning and through this a raising of standards. There is evidence from literature on assessment that the APP materials could be part of a transformation in teaching science and mathematics and we wanted to explore if this would be the case.

The way in which the APP materials have been realised is different in mathematics and science. In both cases a set of ‘assessment focuses’ (AFs) have been defined and level descriptors have been written to define performance in each AF for a particular national curriculum level. In mathematics the AFs are largely based on curriculum content - space, shape and measure, data handling, algebra and numbers and the number system, calculating – with one AF focussing on skills; using and applying mathematics. In science the AFs are based...
on scientific processes – thinking scientifically, understanding the applications and implications of science, communication and collaborating in science, using investigative approaches and working critically with evidence. We are interested in a number of questions:

• How does APP complement what we already know about assessment in general and National Curriculum assessment in particular?

• How is APP being used in schools in mathematics and science?

• What is the effect of APP on the teaching of the curriculum in mathematics and science?

• How do pupils respond to APP?

• Are there differences between in the impact of the APP materials on the mathematics and science curriculum and to what extent can any differences be attributed to the way that the materials have been constructed?

• What are the challenges and opportunities that this approach to assessment present?

We come to this project from the different perspectives. One member of the team has a long-standing interest in and deep knowledge of assessment, mathematics education and mathematics teacher-education. The other member of the team has 20 years of experience of teaching science, an interest in the science curriculum and involvement in initial teacher education in science. The research is on-going.
WHAT WERE THE OUTCOMES OR IMPACTS?

The outcomes and impacts so far are:

An Article in Science Teacher Education No 61 May 2011.

Understanding APP: an investigation into how it works in practice; consideration of how it might impact on learning and teaching in science and the implications for ITT students.

A conference presentation to the ASE Annual meeting in January 2011 (Reading).

A teaching session on the University of Cambridge PGCE (Science) course (based on the interim findings) – December 2010 and December 2011.

Currently the main impact is a deep knowledge of the initiative which is being used to inform the teaching of ITE students.

WHAT WAS THE INTERVENTION/TEACHING AND LEARNING PROCESS?

The ‘intervention’ that we explored was the teachers’ voluntary implementation of the APP materials into their teaching practice. APP assessment grids published by the National Strategies and supporting material are currently being used by the teachers we interviewed in the ways recommended by the national training programme. The scheme is not statutory but as its publication coincided with the abolition of compulsory Key Stage 3 National Tests we knew that some schools would treat the APP materials as an alternative to National Curriculum testing. We are exploring the effects on the teachers, their planning of lessons and their assessment of pupils’ learning and on the pupils, of the implementation of the APP materials in science and mathematics.

HOW WAS THE RESEARCH CARRIED OUT?

The chief instrument that we used in our research was interviews with teachers. We interviewed mathematics and science teachers from diverse secondary settings who were involved with using and developing APP in their school. Some of the teachers interviewed were also involved with promoting the materials locally. We also observed lessons to explore how the materials were used in practice and attended an ‘APP working group’ and observed their proceedings over several meetings.
Early analysis has led to the identification of a number of themes which are being used to direct further enquiries.

WHAT MIGHT THE IMPLICATIONS OF THE RESEARCH BE FOR POLICY MAKERS/PRACTITIONERS (AND WHICH ONES E.G. ENGLISH TEACHERS)?

We anticipate that the research will demonstrate the effect on the curriculum of the way that a scheme of assessment is constructed. Early results seem to demonstrate a marked difference in the effect on the curriculum in Science which seems to be attributable to the process based nature of the science APP criteria. The content knowledge based criteria offered in mathematics seem to have made little difference to the realisation of the curriculum in the classroom.

Our findings will also provide further insights into how assessment might be used to further promote effective learning and teaching in schools.

This would be of interest to curriculum leaders in school, and policy makers interested in the impact of APP.
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