Using and adapting the MAP materials with technology: Raising Achievement through Formative Assessment in Science and Mathematics Education

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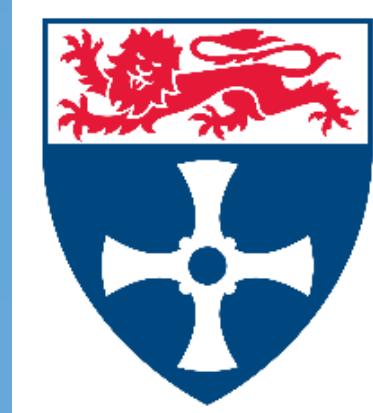
Introduction

Three schools in the North East of England participated in the Newcastle University FaSMEd research:

- All were mixed 11-18 comprehensive (non-selective) schools with links to Newcastle University through teacher education and other research projects. The subject focus was mathematics and the students selected were in the 11-14 age range. Each school recruited between 4 and 6 teachers to trial the approaches and form a professional learning community.
- A re-design methodology, using and adapting formative assessment materials produced for the Mathematics Assessment Project (MAP) by Nottingham University, was used. See http://map.mathshell.org/
- Schools chose how to use the funding provided for technology. One school upgraded their Interactive Whiteboards and projectors; another bought mini-Ipads; and the third purchased Chromebooks.
- All schools used the time/distance activity and then selected a range of activities designed for their age range.
- Two schools were filmed for the project and two teachers from these schools were selected for our case studies.
- Students fed back their views and experiences of the FaSMEd lessons and a small group disseminated these through the design and production of a FaSMEd Comic.

Professional Development

- In case study schools the teachers met together - as a professional learning community - regularly to support each other in the plan-do-review cycle adopted to implement the activities.
- Support from departmental and senior management to facilitate these meetings was crucial in the successful implementation of the innovation.
- Cluster meetings, where teachers from all the participating schools met with the Newcastle University research team to share practice, experiences and progress, were valued by the teachers.
- Peer support and sharing of experiences were particularly important in the significant change in practice necessary to integrate the use of technology for formative assessment.

Formative assessment with technology

How can technology support formative assessment in the classroom?

Making learning visible

|	Where the Learner is Going	Where the Learner is Right Now	How to Get There
Teacher	Clarifying learning intentions and sharing criteria for success	Engineering effective classroom discussions and tasks that elicit evidence of learning	Providing feedback that moves learners forward
Peer	Understanding and sharing learning Intentions and criteria for success	Activating students as instructional resources for one another	
Learner		Activating students as the owners of their own learning	

Figure 1: Formative Assessment Framework including the 'famous five' key strategies for formative assessment (Wiliam & Thompson, 2007).

Sending and Displaying – Processing and Analysing – An Interactive Environment

- Teachers noted that students were more thoughtful about their work when it was displayed for the whole class.
- Students and teachers appreciated the facility to share a range of responses to questions.
- A shared interactive environment for the whole class facilitates communication and assessment for all.

Using a range of tools

Digital technology for formative assessment

Physical technology for formative assessment

Professional learning community in action
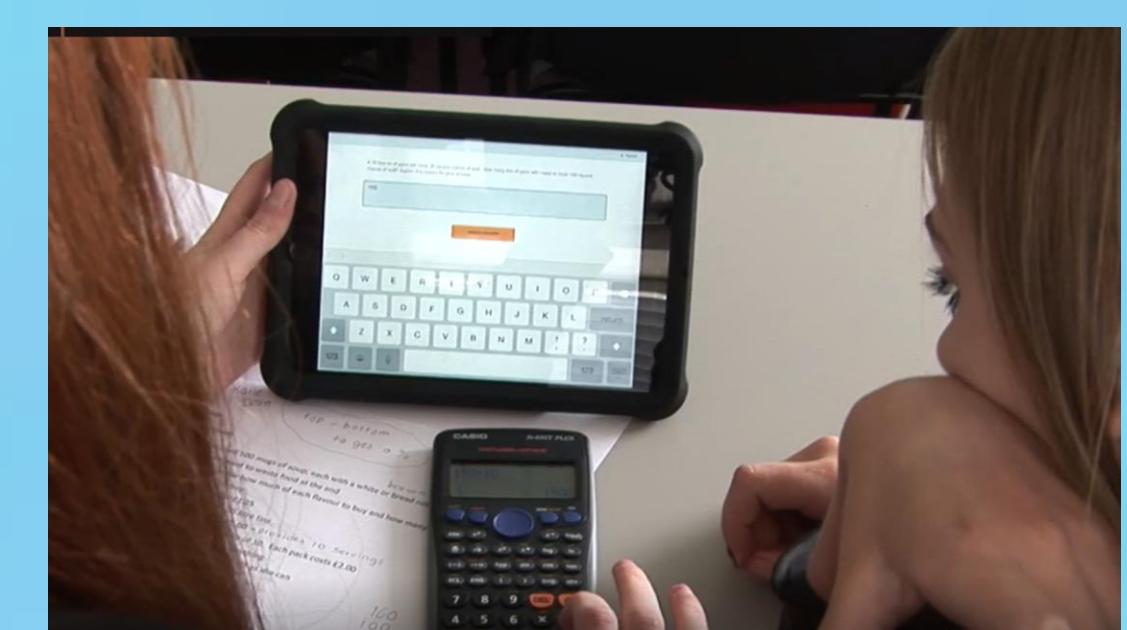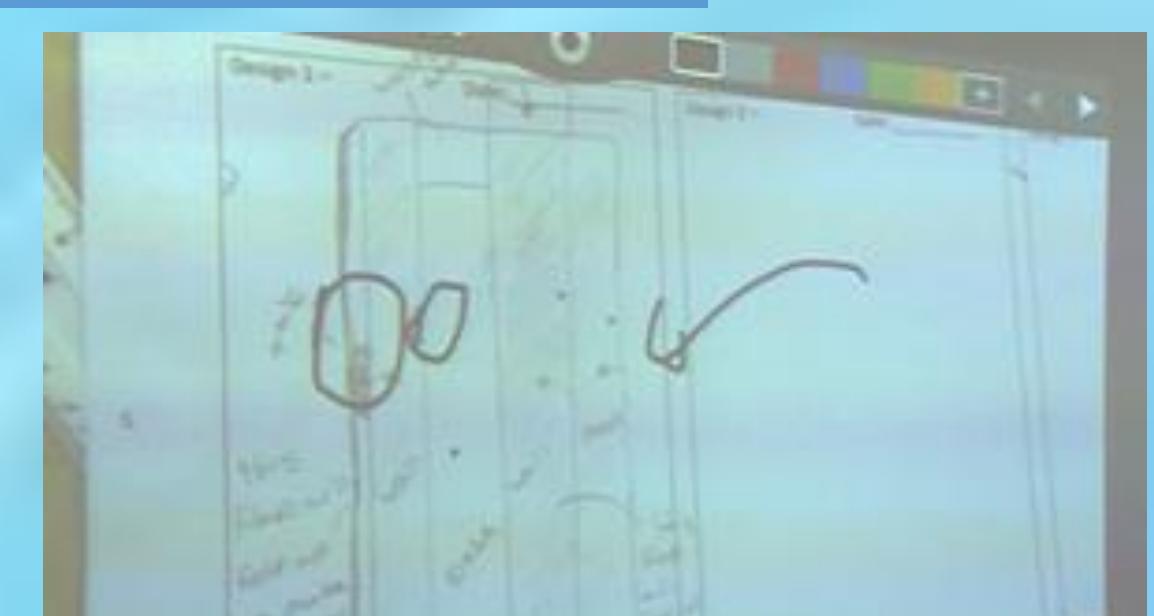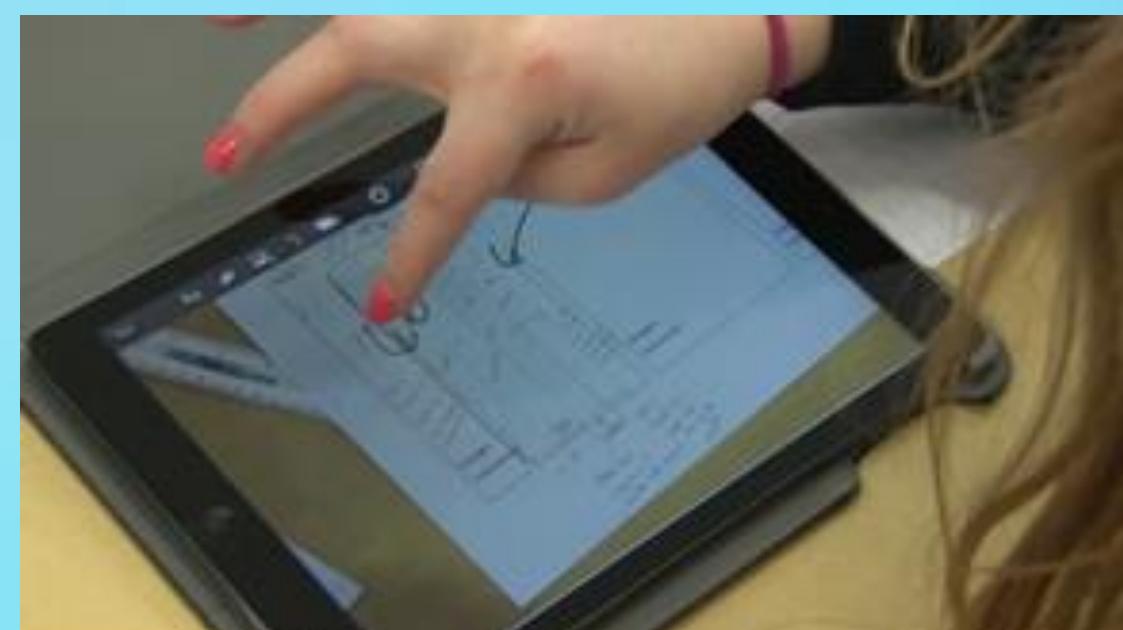
FaSMEd student comic

References:
- Wiliam, D., & Thompson, M. (2007). Integrating assessment with learning: What will it take to make it work? In The Future of Assessment: Shaping Teaching and Learning. Mahwah, New Jersey: Lawrence Erlbaum Associates, 53-82.
- Black & Wiliam (2012). Assessment for Learning in the Classroom, in J. Gardner (Ed) (2012) Assessment and Learning (2nd Edition). London: Sage, 33-48.
- Mathematics Assessment Project (MAP) by Nottingham University. See http://map.mathshell.org/