



Role of technology in promoting formative assessment practices in science and mathematics classes

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Presentation overview

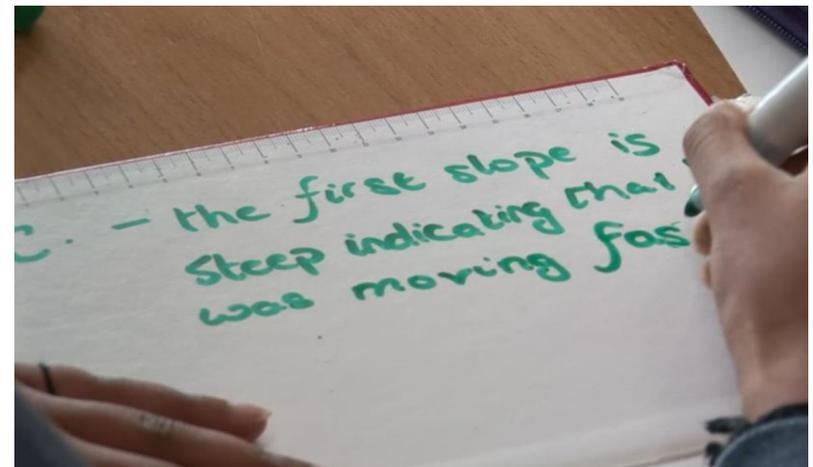
- Introduction to FaSMEd project
- The characteristics of professional development
- Activities undertaken
- Framework for analysis
- Online learning community
- Professional development analysis



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Raising Achievement through Formative Assessment in Science and Mathematics Education (FaSMEd)



Sessions with Teachers

CPD focused on the following aspects of formative assessment:

1. Building on prior knowledge and feedback
2. Identifying and responding to conceptual difficulties
3. Improving questioning
4. Increasing student collaboration
5. Students as assessors

Focus on Technology



Key characteristics of the CPD programme

1. Workshops were interactive and activity-based.
2. Workshops focused on pedagogical practices to enhance student learning.
3. Key readings were provided for participants:
 - to engage with research underpinning the pedagogical practices
 - to promote reflective professional enquiry.
4. Participants were encouraged to share practice in both a formal and non-formal way, to encourage collaboration focused on learning and teaching.

Key characteristics of the CPD programme

5. Workshops were tailored to suit the needs of the participating schools.
6. Participants were encouraged to think and plan how they could develop formative assessment, to build on existing practices, and to explore new practices using a *plan, do* and *review* cycle, promoting reflective enquiry.
7. Participants were encouraged to discuss FaSMEd classes with their students and to be explicit on formative assessment skills.
8. Participants were encouraged to view each other's practice and to give feedback so as to promote mutual respect, trust and support.



Activities



Identifying and Responding to Conceptual Difficulties

Science Toolkit

Activity 2

Insulation



Students Working Collaboratively

Science Toolkit

Activity 4

Heart Rate Invest



Students as Assessors

Science and Maths Toolkit

Physics Organisers



Activities

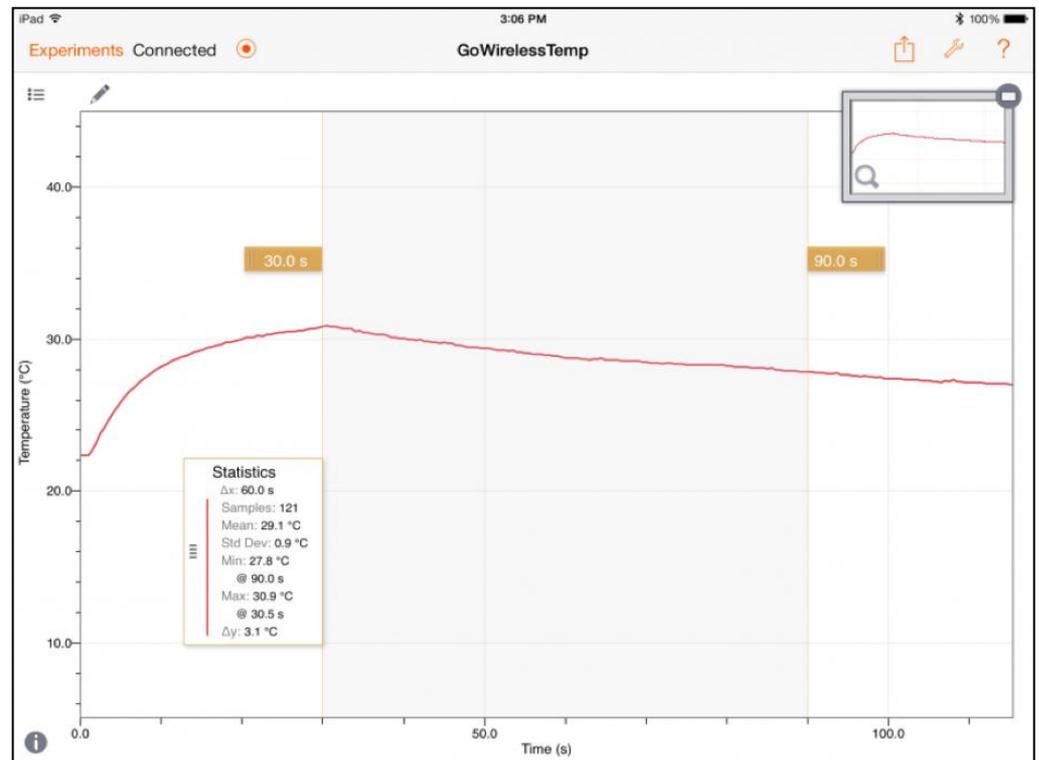


Identifying and Responding to Conceptual Difficulties

Science Toolkit

Activity 2

Insulation



Framework for analysis

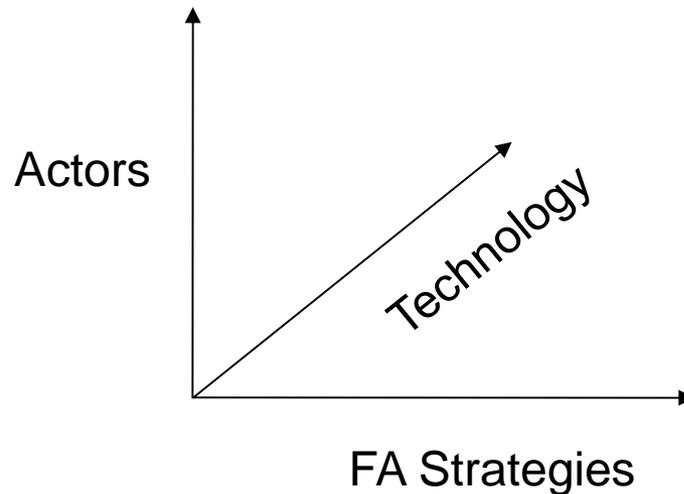
- From a 2D model...

	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	

Framework Relating Strategies of Formative Assessment to Instructional Processes
(William and Thompson, 2007, p. 63)

Framework for analysis

- ... to a 3D model:
 - The assessors(teacher, student, class or peers)
 - The formative assessment strategies
 - The functionality of technology



Assessor/s

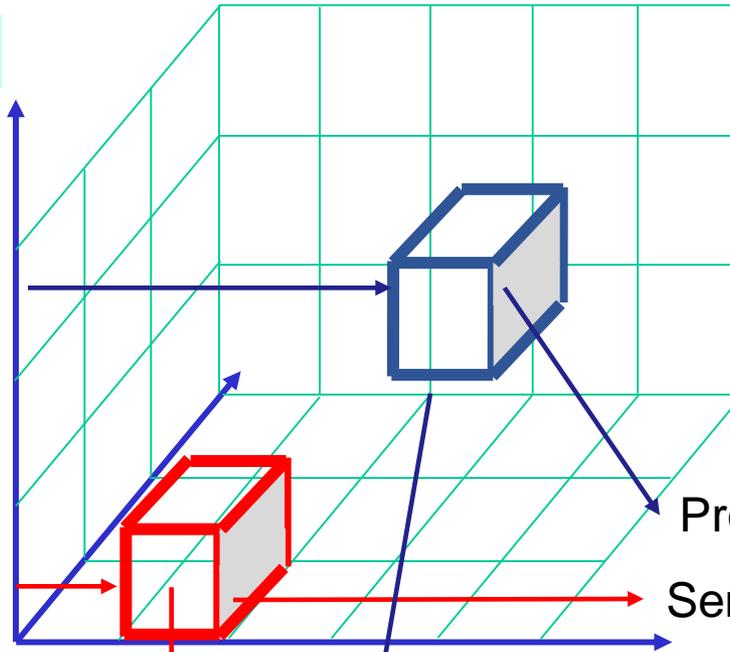
Peer

Student

Teacher

Strategies

- S1. Learning intentions
- S2. Discussion
- S3. Feedback
- S4. Peer learning
- S5. Self regulation



Functionality of technology

Interactive environment

Processing and analysing

Sending and sharing

Insulation Activity

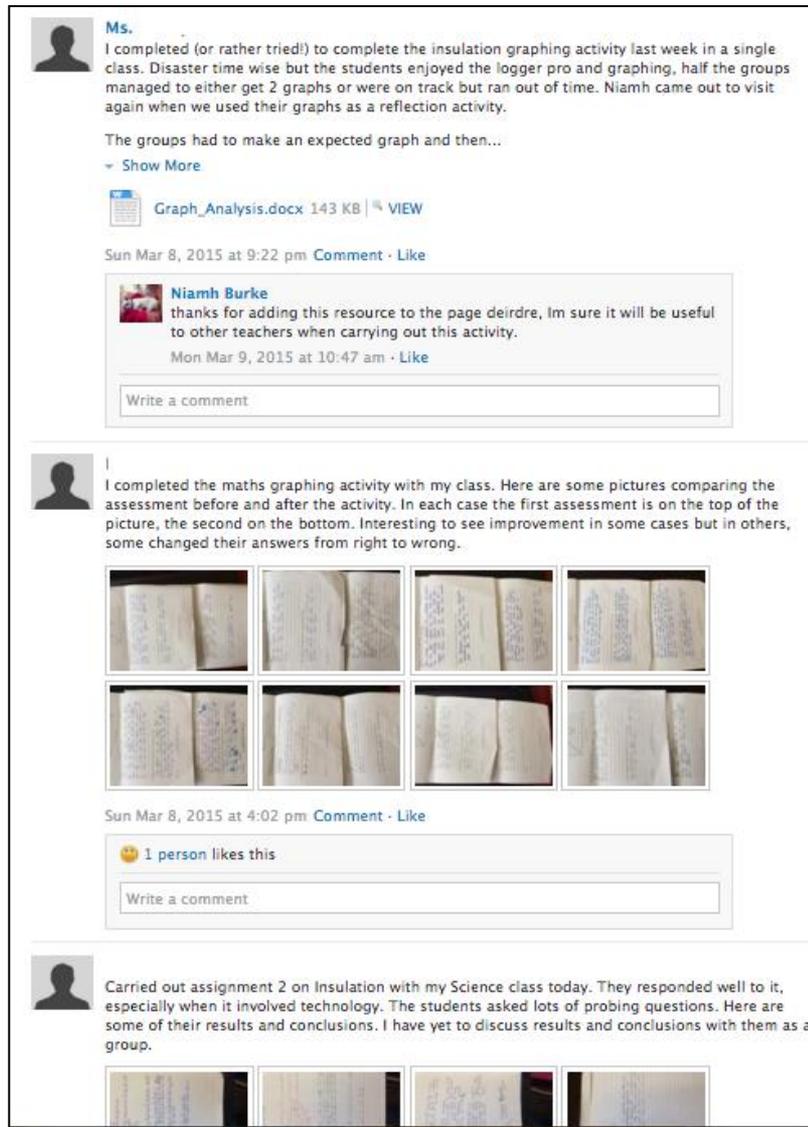


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Online Learning Community



Between CPD sessions teachers shared their reflections and student work on Schoolology. This sharing of practice between sessions encouraged peer support and professional sharing.

A screenshot of a Schoolology feed showing three posts. The first post is by 'Ms.' and discusses an insulation graphing activity. It includes a document titled 'Graph_Analysis.docx' (143 KB) and a comment from Niamh Burke. The second post is by 'I' and shows a grid of eight photos of student workbooks. The third post is by another user and shows a grid of four photos of student workbooks.

Ms.
I completed (or rather tried!) to complete the insulation graphing activity last week in a single class. Disaster time wise but the students enjoyed the logger pro and graphing, half the groups managed to either get 2 graphs or were on track but ran out of time. Niamh came out to visit again when we used their graphs as a reflection activity.
The groups had to make an expected graph and then...
→ Show More
 [Graph_Analysis.docx](#) 143 KB | [VIEW](#)
Sun Mar 8, 2015 at 9:22 pm [Comment](#) · [Like](#)

Niamh Burke
thanks for adding this resource to the page deirdre, Im sure it will be useful to other teachers when carrying out this activity.
Mon Mar 9, 2015 at 10:47 am · [Like](#)

Write a comment

I
I completed the maths graphing activity with my class. Here are some pictures comparing the assessment before and after the activity. In each case the first assessment is on the top of the picture, the second on the bottom. Interesting to see improvement in some cases but in others, some changed their answers from right to wrong.



Sun Mar 8, 2015 at 4:02 pm [Comment](#) · [Like](#)

👍 1 person likes this

Write a comment

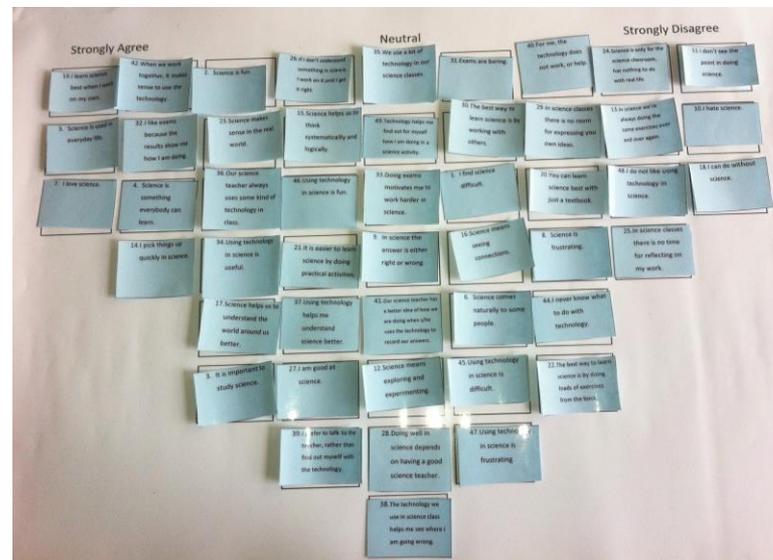
Carried out assignment 2 on Insulation with my Science class today. They responded well to it, especially when it involved technology. The students asked lots of probing questions. Here are some of their results and conclusions. I have yet to discuss results and conclusions with them as a group.



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Data collection

1. Semi-structured interviews with teachers at the beginning and end of the research.
2. Semi-structured interviews with students at the end of the research with the focus on a Q-Sort activity .
3. In-class observation of formative assessment methods;
4. Video data analysis of recorded in-class curricular/formative assessment activities.
5. Questionnaires collected from all students.



Evaluating the Professional Development

Lipowsky & Rzejak (2012) state that CPD activities can be effective on 4 different dimensions:

1. The acceptance of the CPD activity among the teachers.
2. The effects that the CPD had on the professional competencies of the teachers.
3. Consequences for the teacher's actions in the classroom.
4. Changes in the students' achievements.



Thank You!

For more information on the **FaSMEd** project please contact:

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