How can ICT be used to represent abstract mathematical ideas?

Research taster

Teachers can use ICT to help students develop their understanding of abstract mathematical concepts by presenting these concepts in dynamic ways which allows students to manipulate them and gain rapid feedback. Students in one study developed a greater understanding and awareness of graphical representations of functions by manipulating parts of linear and quadratic equations in order to generate various families of graphs. Being able to instantly see the effects of their changes also helped students to develop a positive learning disposition.

Your evidence

You might find it useful to review how a range of activities have helped to develop students' learning about abstract mathematical concepts. Could you focus on one or two small groups and consider the way in which different activities influence the students' understanding and the learning disposition they adopt. Use the table below to record your findings.

Understanding	
Learning disposition	
Teacher instruction	
Working as part a small group	
Working with a partner	
Using ICT to increase dynamic engagement	
Using ICT to increase the pace of feedback	

(Adapted from Reflective Activity 7-2c on the Reflective Teaching website at: http://www.rtweb.info/ch07/ra7-2c.html)

Moving forward

Now you have reviewed your evidence you might like to consider whether some activities support the development of understanding, and others your students' learning disposition? Could you think about how your findings will help you to plan for future lessons where students will be working with abstract concepts? In what ways might you use ICT to deepen understanding and increase engagement by offering you students dynamic experiences with rapid feedback?

Find out more

The full project is InterActive Education: teaching and learning in the information age set out to answer a big question lead by Prof. Rosamund Sutherland, Prof. Susan Robertson, and Prof. Peter John. The project website is at: http://www.interactiveeducation.ac.uk/

You might like to read more about how ICT can be used within the classroom to enhance students learning and understanding of mathematics: Weeden, M. (2002) Proof, proof and more proof in Micromath, Autumn 2002, pp. 29-32. You can read this article online at: http://www.interactiveeducation.ac.uk/Publications/Proof,%20Proof%20and%20more%20Proof%20-%20Marnie.pdf