

Using ICT to support hard to teach topics in mathematics

Inspire me: Using 3-D software to support students to solve geometry problems.

All too often learners can have a confident understanding of the mathematical facts and manipulation skills relating to Pythagoras' Theorem and Trigonometry but are unable to apply this knowledge in real life/exam problem situations – the question that needs answering is why? I would suggest that the learners are not able to correctly interpret the diagram, question, or situation. Too often we as teachers assume that inexperienced learners are able to 'see' what we as competent mathematicians 'see' in a diagram or a situation.

This case study describes an opportunity to use ICT to improve learners' visualisation and interpretation of a 3D geometrical problem situation; allowing learners the opportunity to 'get inside' the shape and understand the relative position of points both on the surface and within the shape.

The task I gave my Year 9 students was to find the length of the longest stick that will fit in the provided closed box. I used Cabri 3D Software to generate an interactive version of the same box on the interactive whiteboard, which allowed learners to open, see the skeleton frame of the box and also to draw and measure lines within the box. Learners were encouraged to discuss their ideas as they developed their answer. Using the ICT seemed to scaffold the understanding and progress of the learners.

I wanted the students to perform the calculations using a paper and pencil (calculator as needed) as this is what would be required in examination situations.

The task was extended to finding angles of elevation and to other 3D shapes. Learners identified more easily the right angled triangles within the shapes and enjoyed using the software to help demonstrate their methods as well as to check their calculations.

More able learners were asked to use the ICT to help them decide whether a series of statements relating to geometry of 3D shapes were always true, sometimes true or never true. It was only through the use of ICT that their answers could so quickly and easily be demonstrated. The dynamic feature of the software enables learners to see changes that would not otherwise be possible.

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