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Integrating real-world numeracy applications and modelling into vocational courses.

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Summary: Practitioner research is in progress at a further education college to improve the motivation of vocational students for numeracy and problem solving. A framework proposed by *A. Tang* et al. [in: Mathematical modelling in education and culture: ICTMA 10. International conference on the teaching of mathematical modelling and applications, Peking, China, 2001. Chichester: Horwood Publishing. 233–248 (2003; ME 2003d.03144)] has been adapted for use in courses. Five levels are identified for embedding numeracy applications and modelling into vocational studies: extension; special subject; investigation report; paper discussion; and mini scientific research. These levels represent a progression from applications set by the teacher, through increasing student involvement in the solution of real world problems, to totally independent project work. Case studies are presented of the incorporation of the five levels of application in engineering, construction, computing, and environmental science courses. In addition to student motivation, teaching staff observed that improvements have occurred in: use of specialised mathematical vocabulary; the combined use of numerical and algebraic methods in problem solving; and abstract reasoning, and a deeper level of understanding of the mathematics used in problem solving. A difficulty which has not yet been fully resolved is the reconciliation of a problem solving and project based approach to numeracy, and the requirement by some Examination Board numeracy syllabuses to assess specific mathematical methods.

Classification: C27 C28 M17 M18

Keywords: adult education; vocational education; numeracy; teaching; motivation; research; observation; interviews; modelling; assessment; problem solving; real-life mathematics; mathematical applications; student attitudes

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