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Research and Teaching – correlated or co-related?

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Abstract Template

Educational Objectives for Problem Solving Skills

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Abstract:

The development of problem solving skills may rightly be regarded as a key outcome in the physical and natural sciences. However, defining exactly what those skills are and developing instructional strategies for teaching them is altogether another issue. In 2008 alone there were over 160 papers published in over 100 different journals which covered topics as diverse as child development, psychology, cognition, computers, neurosciences, mathematics and education (Pizlo, Journal of Problem Solving, 2008). We focus here on two approaches to problem solving commonly discussed in the science education literature; that of novice vs. expert behaviour and field dependence/independence.

Novice vs Expert behaviour is self explanatory; students are essentially novices whose approach to solving problems differs from that of experts. Instructional strategies revolve around identifying the characteristic behaviour of experts and developing activities to foster this in students. Field dependence/independence describes the inability/ability to separate out a problem from its context and restructure it into a more readily solvable form. We examine the relationship between the two approaches and show how educational objectives may be formulated using Marzano's taxonomy.