

DESIGN, DEVELOPMENT AND THE SYSTEMATIC IMPROVEMENT OF PRACTICE

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In this presentation, we will describe, illustrate and analyze the “engineering research” approach to design and development that we and our colleagues in the Shell Centre team have developed over the last 35 years. Examples of the tools we have developed will play a major part – we have found that examples convey meaning with less ambiguity than words. (How various, for example, are the interpretations of “problem solving” around each country, let alone the world!) After a short introduction to the approach, with its focus on research, design and development with a direct impact on classrooms, we talk about tasks - and the clarifying role of the balance of task types across curriculum, assessment, professional development and policy. We then describe the *design principles and tactics* that inform our work, illustrating them through examples of materials for teaching and learning, and formative and summative assessment. Concept-development and non-routine problem solving are two of the main learning foci. We add a brief description of the design and development of support materials. We then return to discuss our engineering methodology and issues in *strategic* and *structural design* – two concepts that focus on the interaction of a design with the system it aims to serve; we illustrate them with some tool structures that we have found to work well. Finally, we introduce the international design community that we have helped develop.