

Problem Solving: Process or Product? A Mathematics Approach to Problem Solving in Knowledge Management

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Abstract : Problem solving in any field is recognised as a prerequisite for any advancement in knowledge. For example in South Africa it is one of the seven critical outcomes of education together with critical thinking. As a systematic way to problem solving was initiated in mathematics by the great mathematician George Polya (the father of problem solving), more detailed and comprehensive ways in problem solving have been developed. This paper is based on the findings by the author and subsequent recommendations for further research in problem solving and critical thinking. Although the study was done in mathematics, there is no doubt by now in almost anyone's mind that mathematics is involved to a greater or a lesser extent in all fields, from symbols, to variables, to equations, to logic, to critical thinking. Therefore it stands to reason that mathematical principles and learning cannot be divorced from any field. In management of knowledge situations, the types of problems are similar to mathematics problems varying from simple to analogical to complex; from well-structured to ill-structured problems. While simple problems could be solved by employees by adhering to prescribed sequential steps (the process), analogical and complex problems cannot be proceduralised and that diminishes the capacity of the organisation of knowledge creation and innovation. The low efficiency in some organisations and the low pass rates in mathematics prompted the author to view problem solving as a product. The authors argue that using mathematical approaches to knowledge management problem solving and treating problem solving as a product will empower the employee through further training to tackle analogical and complex problems. The question the authors asked was: If it is true that problem solving and critical thinking are indeed basic skills necessary for advancement of knowledge why is there so little literature of knowledge management (KM) about them and how they are connected and advance KM? This paper concludes with a conceptual model which is based on general accepted principles of knowledge acquisition (developing a learning organisation), knowledge creation, sharing, disseminating and storing thereof, the five pillars of knowledge management (KM). This model, also expands on Gray's framework on KM practices and problem solving and opens the doors to a new approach to training employees in general and domain specific areas problems which can be adapted in any type of organisation.

Keywords : critical thinking, knowledge management, mathematics, problem solving

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