

## ***Working Group 5: Real world Applications of Mathematics*** ***Ivan Meznik, Agata Hoffman & Aldo Scimone***

Direction of mathematics teaching methods to reflect problems of real- life milieu is undoubted. The wording „Real Life“ in the title is to signal that the problems under investigation :

- (1) may address and possibly attract considerable part of population,
- (2) may be clearly formulated for the people to get them,
  - are influencing the benefit of people,
  - are interdisciplinary and complex,
  - claim nonstandard or heuristic approach supported by computer software to find their solution,
  - will concern mathematical processing of various types of information about real physical world.

As usual, a *problem* is a situation which carries with it certain open questions that challenge somebody who is not in immediate possession of tools sufficient to answer the question. Then, *problem solving* refers to the entire procedure of dealing with a problem in attempting to solve it. In a favourable case such procedure exists and it remains merely to get information of it and subsequently use it. In realistic situations, as specified above (particularly due to complexity and interdisciplinarity), a standard method yielding satisfactory and generally acceptable results does not exist. The reasons are objective and also subjective ( eg different criteria of assessing the results). To investigate such situations all possible information data types must be taken into account. Besides deep knowledge-type data items (eg basic laws of nature) which are always in minority, the bulk of other data are mostly of shallow or fuzzy knowledge –type data items (eg statistical data, non-numerical characteristics, engineering feeling, experience,...) . A close cooperation of mathematicians and experts from other disciplines is quite wanted. Naturally, *modelling* is knocking the door as a rescue method recommending to find the solution via the cyclic process : real word problem statement-formulating a model-solving mathematics-interpreting results- evaluating a solution-refining the model-real word problem statement-... . But for this, the developing of mathematical potentialities ( reasoning, creativity, originality, adaptability, estimation of results, orientation in nonstandard situation,...) simultaneously with acquiring traditional mathematical knowledge is of crucial importance in instructing of mathematics. It should be a clear message to mathematics educators.

Papers which were presented in Cairo 1999, Amman 2000 and Palm Cove 2001 possess desirably more than less such features and document the mentioned aspects. Of course, the context range of „Real Life“ is extremely diverse and very extensive. Although the complexity and miscellaneous nature of issues may seem to be rather out of scope of current mathematics teaching didactics, there is a convincing feeling that applying mathematics in real life situations may as a feedback initiate reasonable conceptual changes in mathematics teaching.