This paper describes the work-in-progress of the development of an intelligent authoring tool for applied mathematics. The main objective of this tool is to be useful to human tutors and students of domains that make use of algebraic equations. Such domains could be physics, economics, chemistry etc. The human tutor aims at providing the domain knowledge through a user-friendly, multimedia interface so that s/he can be assisted by the tool at constructing exercises. After exercises will have been constructed the tool will be able to monitor students closely through its student modelling component.

In particular the tool takes input from a human tutor about a specific equation-related domain (e.g. physics). This input consists of knowledge about specific formulae, variables, units of measure and their relation. The human tutor does not have to provide the complete list of variables and equations right from the start. S/he may only give the ones that will be used in the problems to be constructed and add more in a subsequent interaction.

The tool accumulates domain knowledge each time that the human tutor gives new input. This means that the human tutor may give information to the tool at the same rate as lessons progress in a course. When the human tutor wishes to create exercises s/he can type in what is given and what is asked and the tool can either construct the full problem text or provide consistency checks that help the tutor verify its completeness and correctness.

When a student attempts to solve an exercise the student modelling component performs error diagnosis so that appropriate advice can be provided. The student modelling component incorporates a history mechanism that records inferred student features. The history mechanism is used to resolve ambiguities that arise from errors for which more than one hypothesis can be generated for the reason that caused them.