Morals of the heapsort modelling exercise

About EM

- It is possible through modelling with artefacts to make highly sensitive and discriminating semantic distinctions - cf promiscuous modelling [Cantwell-Smith] using abstract mathematical models
- It is possible to construct computer models without predetermined goals, formal IO behaviours and use-cases: uncertain interaction in the world is conceptually prior to formalisation
- We are just at the beginning of understanding how to organise and manage EM model development: need better tools, but also need unorthodox strategies for dealing with issues such as versioning and documenting.

About classical computing

- Much of classical computer science is motivated by optimisation to specific goals (as was historically expedient); clearly specification of function is a prerequisite for optimisation, but it is a mistake to imagine that such specification is an essential prerequisite for constructing computer models.
- Functional specification is not very prescriptive where program development is concerned
- Abstract data types do not really capture the analogue characteristics of data types as pseudo-physical artefacts that embody understanding, and underpin mental models to aid the imagination

About 'computers for learning'

- How we construct models is highly relevant to how useful they can be in supporting learning cf. Logo as a vision for constructionism
- Interaction that is creative in character has to accommodate situation, ignorance and nonsense (the SIN principle) - essence of learning is the capacity not to know, to be suspicious of perfect knowledge, and to be able to make mistakes; these require support from modelling approaches that negotiate meaning through interactive development rather than prescribe the interpretation of interaction in advance

About the relationship between EM and classical programming / software development

- The distinction between EM and rapid prototyping and iterative development as in XP is ontological rather than being simply a matter of degree: the basis for EM is in the notion of construal, and continuity in EM development is in the 'stream of thought' (cf car maintenance analogy)
- The 'experimental paradox' is central to the distinction between EM and the classical theory of computation
- It is more appropriate to seek a foundation for specification and logic in EM than to seek a foundation for EM in specification and logic