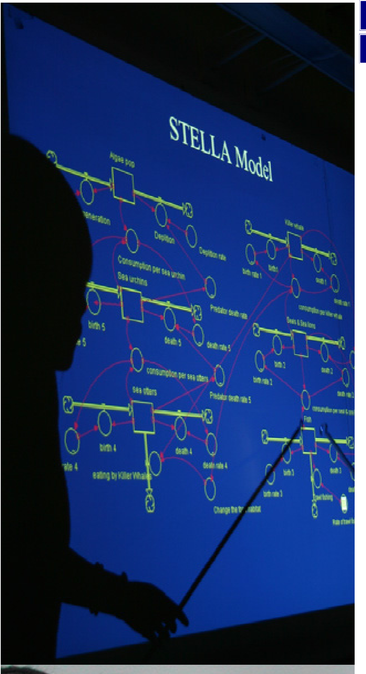

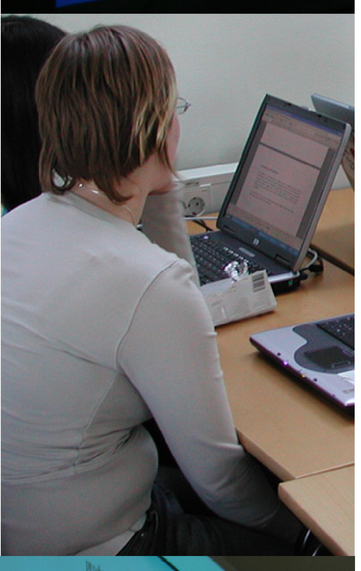

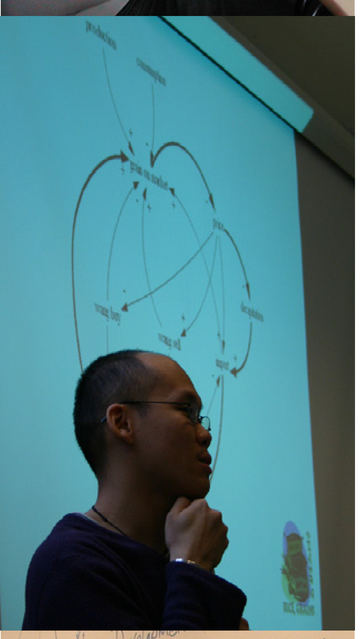

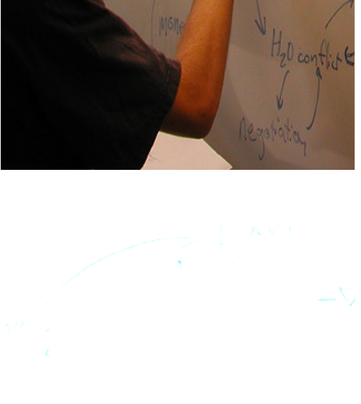

Learning System Dynamics:
Cognitive Processes and Constraints

Mats G E Svensson Centre for Environmental studies &
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Preliminary results from a cognitive study of a Environmental Science Master's student class in System Dynamics, at Lund University, Sweden

Why?

How can learning System Dynamics be improved?

What is the role of mediating tools in the problem-solving process? -
Groupwork, CLDs, Quantitative modelling, Reporting

How is groupwork enhancing learning?

What?

Groups of Master's students in System Dynamics were followed by video-recording and screen capturing through:

The use of mediating tools in the problem-solving process

Groupwork discussion in an educational practice (groups of two or four):

- Iterated CLD's
- Quantitative modelling (e g STELLA)
- Final reporting

The cognitive science perspective

Cognition is manifested in the relation between the individual and her environment

The role of the discourse

Discourse is the ground of our experience of language and of linguistic meaning. It is in discourse that we most adequately convey our thought.

Reasoning and coordinating actions with the help of artifacts

Artifact = human-made construct or tool

- Material , e g tools
- Psychological, e g language, expressions

Appropriation

Appropriation is the act of setting apart and applying to a particular use to the exclusion all other.

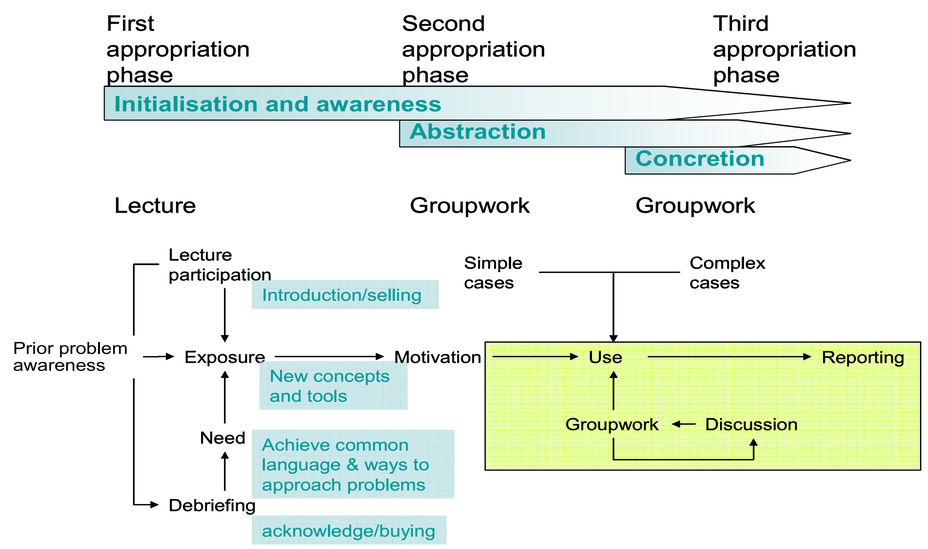
Exposure to learning situations

Decide on what is relevant and interesting

Use and master specific forms of language and physical tools

Master ways to reason and act in specific social contexts

Appropriation phases



What we found:

Groupwork discussions

Storytelling worked as an analytic approach

Roles: Explorator vs Confirmator

Breakpoints <-> Clarifying moments

Iterations and retakes

Preconceived models are limitations

Iterated CLDs are important

Preconceived structures often steer choice of structure and approach

Few iterations, generally

Fairly good at understanding/identifying structural loops but more seldom discussing dynamic feedback processes

Seemingly hard to abandon previous structures

Quantitative modelling problems

Software problems

Structural problems

Quantification problems

Final reporting

Backcasting by confirmation and comparison between start, onset and final result

Show evidences of supervisor's roles

Low appropriation value from a SD learning perspective, but enforces synthesising

Feedback is essential

Poster presentation at The 22nd International Conference of the System Dynamics Society, Oxford, England July 25 - 29, 2004
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Back to the Top