THE VIRTUAL MANAGER ©
A Different Simulation for Managing Complexity

Paul Moschella, University of Hartford

ABSTRACT

The world grows more complex and dynamic. We need to educate our learners to better manage complexity. How? The author posits that with computer technology, case pedagogy can be enhanced to more fully develop the unique cognitive strengths of the mind in order to cope with complexity.

THE MANAGING MIND

Many believe the best instrument for managing complexity is the mind (Rozak, 1987). The mind's ability to encompass values, senses, knowledge, questions, representations and creative thinking warrants serious effort to improve its use in solving complex problems. One such effort are the programs for developing *critical thinking* at the secondary levels of education SCANS (1991). In critical thinking, information is not assumed correct, but rather, is questioned, analyzed, compared and contrasted. An intellectual position is developed and a justification prepared. But, the learner's ability to question is poorly developed. Considerable difficulty and fatigue is encountered in maintaining focus, directing the mind and transferring the skills of the teacher to the learner. Nevertheless, if we are to manage complexity, our efforts must go further. We require strategic thinking - achievement of goals amid complexity (Wolfe, 1994). How can we move to this next level of managing or strategic thinking?

Metacognitions

Cognitive scientists have made tangible progress relating the mental components of thinking; e.g., sensory input, information gathering, knowledge representation and cognitions. Several theorists are researching the role of question-asking and answering in this process (Graesser, et al., 1992) which had led to a growing interest in a next level of thinking - *metacognition*. Metacognition or mental management is the function performed by the mind when it *directs the focus* or application of the mind to achieve an understanding of a complex situation - a close identity to strategic thinking (Swartz, et al., 1997).

Reaching This Next Level of Directed Thinking

Cases have been widely accepted as a primary pedagogical tool with which to practice solving complex problems with its capacity to evoke critical and creative thinking Schoen & Sprague (1954). It thus appeared logical to use cases as a pedagogical foundation for improving the learner's strategic thinking or metacognition. However, when the present case process is carefully examined, it does not permit the learner to engage in certain critical cognitive activities presently completed by the case writer. The case writer with experience:

- probes, scans, searches and *questions* a situation for information
- *develops a representation* of "what is going on" - a task which is basic to all managing
- *filters and edits* this information to present his/her perception of the situation or case.

The learner is unable to exercise the critical cognitive functions of global questioning and interpretation. The author's position is that by integrating recent advances in educational psychology, metacognition, question formulation and computer technology, current case pedagogy can be significantly enriched. Case pedagogy enlarged to include question-asking and situation formulation can materially motivate the learner to raise his/her mode of thinking and perceiving to the

next level of managing - metacognition or strategic thinking.

DESIGN OF A QUESTION-DRIVEN MANAGING SIMULATION

To enlarge case pedagogy, it became apparent that computer support would be required and two software components would have to be created:

- *A case database* to more fully reflect today's complexity - in this prototype, information was assembled on the global automotive industry using notes much like a case writer would collect reflecting social, economic, political, technical, philosophical and cultural events - approximately 10mb of text, graphics, animation, pictures and audio information.
- *A Query Machine* for rapid, interactive questioning - a protocol giving the learner control of all questions asked using seven major disciplines, about 1200 concepts across these disciplines and three strategic environments - global, industry and organization.
  Output for program response - is on electronic media for easy review, filtering, compiling, editing and printing.

THE EXPERIMENT

Thirteen learners were asked to search and report the firm's strategic position and submit a plan of action **(Virtual Managers).** All finished the experiment. Only eleven could complete the program survey and evaluation.

A Sample of Learners' Responses

Did MultiManager© make you use your mind's knowledge? Yes, the simulation helped me to use my own knowledge.

Did the Program motivate you to recall concepts you haven't used? Yes, it stretched my mind to dig for older concepts and appropriate ways of asking questions.

Did you find that you were playing a more satisfying role getting information, rather than being provided with? Yes, I felt more productive being in charge of looking for information, rather than being spoon fed.

Would you like to repeat this exercise using another situation (industry)? Yes, I would love to try another industry. Yes, I think it helped me learn about the car industry. I would like to learn about another industry the same way. It is very realistic.

Should the Program be expanded? Yes,11 No,0.

CONCLUSIONS

For Learners:
- The learner is constantly and cognitively involved in questioning and thinking
- Curiosity and "discovery" obviously motivate the learner
- The learner has the opportunity to prepare his/her own perception of the situation

For Instructors: The instructor can follow the learner's strategic thinking as recorded on the student's disk.

REFERENCES

Graesser, A, et al, (1992). "Mechanisms that generate questions" in (Eds.) (1992) Lauer, T., Peacock, E., & Graesser, A. *Questions and Information Systems. 235-238,* Hillsdale, NJ: L Erlbaum Associates

Rozak, T. Boland, R.J & Hirshheim, R. (1987) (Eds). *Critical Issues in Information Systems Research.* New York, NY. John Wiley & Sons, 1987)

SCANS report for America (2000), US Department of Labor, 1991

Schoen, D. A. & Sprague, P. A. 1954. The case method as seen by recent graduates.: In McNair, M. P. (Ed.) *The Case Method at Harvard Business School*. NY: McGraw-Hill

Swartz, R.J. & Perkins, D.N. 1997. *Teaching Thinking: Issues and Approach*. Pacific Grove, CA: Midwest Publications

Wolfe, J (1994). Recollections on 25 years of simulation/gaming. *Simulation & Gaming,* 25, 274-279.