

## **Approaches to Diagnostic Business Simulations**

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The depiction of decision-making processes within complex-dynamic environments has become a field of research based in different paradigms. According to Sternberg (1995) there are two principal approaches to studying expertise in complex problem solving. One approach refers to Broadbent (1977) in England, the other one to Doerner (1987) in Germany. The principal difference between the traditions is that the former is rule based specifying a mathematical definition that would optimize the problem while in the second the problems are that complex that no mathematical solutions can be defined. Doerner's approach makes use of computer-based micro-worlds. Participants have to act within a simulated complex environment. This approach has been extended to the assessment of managerial decision-making competence (Frensch & Funke, 1995). Managerial 'success' becomes evaluated mainly by the level of the system statuses which participants achieve by means of their interventions (decision-making) into the system. There is agreement that in addition process-measures should be a source of valuable information for the evaluation of problem-solving competence.

An approach using such process measures has been developed by Streufert (1997) and associates. This line of research is based in the paradigm of Perceptual Complexity Theory. It makes use of quasi-experimental simulations which apply an event-driven approach. Participants become exposed to a scenario which includes needs for crisis management. For that reason the approach has been labelled 'Crisis-Management Simulations' respectively 'Strategic Management Simulations' too.

System-dynamics based micro-worlds in general hold no diagnostic features. However, these could be extremely valuable for giving feedback within learning processes and for the adaptive adjustment of micro-world based learning environments. This could be applied too for evaluating the level of performance at which participants can act when they have to control a given scenario by means of interventions into the system (Breuer & Satish, 2003). For setting up such diagnostic systems it needs a theoretical foundation. In that respect we refer to the approaches of complex-problem solving theory (Doerner) as well as to Cognitive Complexity Theory (Streufert) in order to reflect on their potential use for grounding diagnostic SD-based simulations. There is a prototype of such a diagnostic business simulation under development which shall be available within the presentation.

## References:

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