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COMPUTERISED TUTOR SUPPORT SYSTEMS

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ABSTRACT

The tutor support system demonstrated was added to an andragogically valid business simulation to explore and test facilities to support the tutor running computerised business simulations on executive short courses.

The Tutor Support System (TSS) links to the simulation model to provide reports specifically for the tutor rather than for participants. It is intended to help the tutor facilitate and manage the learning process and is described in this context.

Although designed for a specific simulation the TSS shown represents a general architecture that could be added to new or existing simulations.

INTRODUCTION

The simulation used to host the TSS was A Management Experience (Hall 1976). This was originally developed to run on the GEISCO computer time-sharing bureau and, subsequently, transferred to microcomputers. It has been run extensively on executive short courses.

A Management Experience is a complex general management simulation designed to address tactical management issues at a middle management level. It lasts a day and a half and used at the end of a short course, as a course theme, as a stand-alone training event and, in an accelerated manner, on Assessment Centres (Dulewicz & Fletcher 1982).

In 1992, as part of research in to the design of computer aided management education, a Tutor Support System was added to Management Experience. The need for TSSs was discussed at two workshops at the 1993 SAGSET Conference (Hall 1993) and is described and discussed in chapter iii The Simulation and Gaming Yearbook 1994 (Hall 1994).

TUTORING NEEDS

As Management Experience runs it generates data for the tutor that is separate from normal team results, data verification or business research. Hall (1994) suggests this data is required to provide:

RULE CLARIFICATION
SIMULATION SUPPORT
KNOWLEDGE SUPPORT
LEARNING PROCESS MANAGEMENT
LEARNING ASSESSMENT

Rule Clarification

Of necessity, on executive short courses, time is at a premium. Thus both simulation manuals and the business results produced by the simulation is limited. Thus one function of the TSS is to provide explanations and reconciliation's of accounting and operational aspects.

Simulation Support

Besides the accounting and operational aspects of the simulation there is a need for the tutor to understand the econometric models. Specifically how the market is responding to specific decisions, how quality, morale etc. is affecting factory efficiency, etc.. Thus the TSS needs to reveal the "cloaked data" (Hall 1994) used in these econometric, black box. models. This and the accounting and operational output can be refined further and strengths and weaknesses identified.

Knowledge Support

During the simulation it may be necessary to, selectively, supply additional business knowledge or stimulate thought. Thus a function of the TSS is to enable the tutor to provide additional feedback for this purpose.

Learning Process Management

Hall & Cox (1993) discuss the learning process in terms of an analogy with a servo-mechanism where feedback is provided through the team's business results produced by the model and by the tutor analyzing, diagnosing and providing additional feedback as necessary. TSS needs to support this analysis, diagnosis and feedback by providing additional reports on business performance.

Learning Assessment

One can argue (Hall 1994) that improving business success during the simulation suggests cognitive learning and unsuccessful teams may become disaffected with the simulation. Therefore, there is the need for the tutor to attempt to continuously assess learning. The difficulty of doing this cannot be discounted but, even quite crude measures, should be provided by the TSS.

SOFTWARE FUNCTIONALITY

The Tutor Support System built onto A Management Experience explores the following software functions:

AUDIT REPORTS & COMMENTARIES
DECISION SCREENING
SUCCESS MEASUREMENT

Audit Reports & Commentaries

The audit reports and commentaries produced by this TSS provide analysis, diagnosis and feedback information from the simulation model. In doing so they help the tutor answer questions, reveal the operation of the model, provide additional analysis and a diagnostic list of strengths and weaknesses. The audit reports and commentaries consist of the following elements:

Reconciliation's & Explanations
Cloaked Data
Business Analysis
Strengths & Weaknesses

Reconciliation's & Explanations are provided to help the tutor answer about the derivation of results questions rapidly.

Cloaked Data provides data to help the tutor comprehend how the "black box" econometric model is responding to team decisions.

Business Analysis involves the further processing of team results to provide data about how well teams are running their business. Therefore, it may involve analyzing the business as several separate investment centres or analyzing the efficiency of the business on a standard cost basis.

Strengths & Weaknesses draw on cloaked data and business analysis to provide performance highlights in qualitative terms.

Reconciliation's & Explanations, Business Analysis and Strengths & Weaknesses may be selectively fed back to teams to stimulate thought.

Decision Screening

Decision screening builds on the usual character checking and range checks. It adds more Intelligent" checks by attempting to replicate the way an experienced user of a simulation scans decisions and attempts to identify sophistic thinking. This "Sophistry Screen" checks for sophistic and arbitrary decisions. Sophistic decisions suggest cognitive learning problems and arbitrary decisions suggest affective, motivational problems.

The sophistry screen analyses a team's decision in the context of the other decisions, the current business position, history and team derived forecasts.

Success Measurement

Success measures are based on the notion that better performance in a business sense suggests cognition and, because of the competitive aspects of simulations, poor performance may produce disaffection. Success measurement in A Management Experience is NOT used to choose a winning team or award marks. It is designed to help with the diagnosis of learning problems. The following measures are provided:

Hall, J J S B (1976 & 1992) *A Management Experience,* Hall Marketing. London

Business Success
Strengths & Weaknesses Index
Sophistry Index
Efficiency Measures

Business success is measured on an exponentially smoothed residual income basis.

The strengths accumulation importance of & weaknesses index is an exponentially smoothed of the balance between the number and strengths and weaknesses.

The sophistry index is an exponentially smoothed accumulation of sophistries.

Efficiency is measured in terms of lost profit based on "ideal" operating levels.

PRACTICALITIES

The addition of the tutor support system both increased the amount of output and software size. For every page of team results the TSS generates three pages of Tutor support material.
Increased software size is even more dramatic. TSS code is ten times as large as the core model's code. In addition there is the need to browse through the TSS data and selectively present it. This expands the software further.

A Management Experiences TSS is still being developed and, how it benefits learning management, assessed. However, initial use, over a year and a half, suggests that it does provide significant support, even for the experienced tutor.

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BIOGRAPHY

Jeremy Hall owns Hall Marketing a firm specializing in developing, running and supplying simulations for management training. He holds a degree in Electrical Engineering and is currently pursuing, part time, research into computer aided management education at Imperial College, London.

Jeremy worked for General Electric in the USA, Honeywell Information Systems and Ashridge Management College in the UK before setting up his own firm.

He developed his first computerised management game in 1970 and since then has developed more than three dozen business simulations covering a wide range of learning objectives. Business Success