

# Experiential Learning Enters the Eighties, Volume 7, 1980

## TECHNOLOGICAL FRONTIERS IN COMPUTER SIMULATIONS FOR BUSINESS EDUCATION

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Recent advances in micro-processor, memory-manufacturing, and telecommunication technologies have released a number of previously exotic computer capabilities into the real of practical business simulation. The overwhelming array of technologies can be stratified into non-orthogonal categories determined by the nature of their impact on each type of organization playing a role in the business simulation "industry." This matrix analysis of the trends can simplify interpretation of the technological trends to facilitate the decision-making process of those individuals and organizations playing a role in the business simulation industry. The most important conclusion from this analysis will be that against this background of exponentially-growing trends and ramifications, the non-technical (non-'computer-jock') business faculties will be catapulted into the center stage of what has historically been classified as computer-based education.

### EMEGING TECHNOLOGIES

The most recent entries into the realm of practical business simulations include the following technologies: third- and fourth-dimension computer graphics, home computers/micro-computers distributed-processing minicomputers, national and international telecommunication networks compatible with micro-computers and terminals, Computer-Output Microfilm (CQ4), computer-generated speech, specialized simulation languages, specialized simulation networks real-time processing, Braille computers and Braille compute output, and a proliferating array of innovative technologies that promise to leverage the effectiveness of computer simulations in education while simultaneously threatening to substitute the judgment of reputable pedagogical leaders with the influence of promotional 'whiz kids.' Authors, publishers, university computing centers, professors, and students have already started feeling, if not reacting to, the impact of those technologies. Quite often, the monetary impact of decisions in this field overshadow the monetary impact of most other decisions made at the professor level; all those coinciding with the forthcoming severe budgetary strains left by the wake of the post-war baby boom.

### ANALYSIS

The ability to cope with those trends will determine whether any individual or organization will be affected negatively (through advanced obsolescence) or will be able to capitalize on the opportunities (via added flexibility and effectiveness). With the intention of facilitating analysis, the overwhelming array of technologies were stratified into non-orthogonal categories determined by the nature of their impact. The principal seven categories against which each technology was rated are: realism, cost, portability, compatibility, simplicity of creation, and simplicity of utilization.

#### Realism

Each technology can be rated according to the degree of realism it can add to a simulation. Real-time processing, computer-generated speech, and, under some circumstances, Computer-Output Microfilm (CQ4), represented the technologies that could contribute most towards increasing the realism of simulations.

#### Cost

Although a diminishing-cost trend can be detected in most new technologies related to computer5, it is useful to rank the technologies according to their tendency to reduce the cost of running simulations below their current level. By this criterion. Specialized Simulation Networks, Telecommunications Networks, and Micro-computers ranked highly.

#### Portability

The capacity to use business games for seminars, or at least without the need for large computer centers, suggests that this criteria be used to rank technologies Distributed-processing Minicomputers, Telecommunications Networks, Specialized Simulation Networks were all rated highly by- This criterion. Pocket calculators were rated highest, but can only be used as supplements and complements to other simulations.

#### Compatibility

From the standpoint of the authors, publishers, and distributors, this criterion gains particular significance as the software development costs skyrocket. Specialized Simulation Languages, Telecommunications Networks, and Specialized Simulation Networks rated highly compatible.

#### Simplicity of Creation

Indisputably, Specialized Simulation Languages and Specialized Simulation Networks will be contributing most to the objective of compressing the design and developing phases so that software development may keep abreast of hardware development.

#### Simplicity of Utilization

When this criterion is applied, both Real-time Processing and Specialized Simulation Networks emerged as the dominant emerging technologies.

After the technologies under consideration have been ranked under each of the above criteria, the analysis proceeds by identifying which criteria are most important to the analyst. The importance of each will depend on whether the analyst is an author, a publisher, a university computing center, the university administration, a professor, or a student. The order of importance may also vary seasonally for any analyst.

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### **APPLICATION**

This analysis must be exercised by present and future simulation authors to monitor characteristics in existing simulations and integrate them with the emerging technologies to extend the longevity of their simulations. University computing centers, also, must evaluate these trends to avoid expensive hardware obsolescence that can limit curriculum flexibility, prevent successful adaptations neglect the practicality of new technologies, miss substantial savings opportunities, and stagnate its curriculum development,

Among other implications derived from the above, we should note that as second-generation business simulations have been standardized into manageably simple curriculum exercises, non-technical faculty will gain the dominant majority position in the application of computerized business simulations. As a result, while the majority of business school professors are facing increasing simplicity in the application of business games, those professors with a long-standing interest in business simulations (e.g. ABSEL members, et. al..) will be facing the increasingly complex task of managing the introduction of future computer technologies into the field of education.