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THE EFFECTS AND CONSEQUENCES OF TEAM MEGATRENDS ON SIMULATION GAMING: ONE VIEW

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ABSTRACT

This paper discusses the possible implications of several of Naisbitt's megatrends on simulation gaming. While improvements in technology will offer a wide variety of new alternative pedagogies, we have some doubts as to their widespread adoption.

INTRODUCTION

To a large extent, the ten megatrends projected by Naisbitt [9] and discussed in Richman [10] are related to the high technology explosion and the subsequential change in our private and work lives. As such, one could use the Richman [10] article as a springboard to discuss potential hardware and software improvements and the effects that those improvements will have on business teaching methodologies. While we plan to discuss some potential improvements, we believe it necessary to start by making a cautionary comment. Projections of the impact of technology on society are common and usually are quite provocative. However, many of the forecasts do not eventuate. Others occur, but at a much later time than predicted; while still others arrive before expected. We wish to point out that Naisbitt's methodology, is a subjective combination of qualitative analysis based on trend projections. Thus, even though Naisbitt's data base is substantial, it still can be criticized on the basis of selectivity. Also, trend analysis has long been termed a "naive" prediction technique due to its assumption that the future will track the past. In short, we educators have the option of being either proactive or reactive with respect to these predicted impacts. Naisbitt's observations are food for thought rather than gospel.

If one looks at college teaching cynically, one notes that the majority of students' classroom experiences are not that different from what students experienced a century ago. Students still sit through lectures a few hours a week, take a few examinations, and receive three hours of college credit. We are willing to bet that the majority of the classes at most universities do not involve the use of case studies, of experiential exercises, of the "live case" method, of simulation games, or of other types of computer-based instruction. Thus, while technology has changed greatly in the last century, the shift to "participative teaching methodologies has been almost inconsequential in contrast.

Some apologists will note that much of the technology is fairly new, and that there has not been sufficient time to incorporate it into our teaching procedures. However, many innovations have been with us for many years without changing our teaching profoundly. The telephone has had great impact on our society, but relatively little on the classroom. Uses such as the telephone conferencing done by Martin Zober and others at Iowa State University allows classes to communicate directly with decision makers. While marginal top-level executives are reluctant to spend the time necessary to visit the campus (unless they have close ties to the university), the faculty at Iowa State have had success in obtaining the cooperation of numerous executives in participating in telephone conferences. But such uses of telephone technology are not common. Educators have

just not responded to its obvious potential as a learning facilitator.

Similarly, television has changed our society drastically in the four decades that it has been available to the public. But how many successful uses of television in the classroom have been reported? The vast majority of use of television boils down to one way delivery where the educator pops a video-tape of 60 Minutes" or some other television show into the machine and leaves the class with his graduate assistant. The more imaginative users set up a system at the campus audiovisual center where students can view the videotape at their convenience. Television seems to have effectively supplanted the 16 millimeter film, and that is about all. Yet, talkback television systems are a reasonably efficient means of teaching. Unfortunately, few who have been involved in either side of the process would label the process "effective." For example, the talkback television M-A program at Oklahoma State University is being phased out, to loud applause from the faculty. Yet programs such as "Sesame Street" indicate that the medium can be very effective if used creatively. Instructors such as Ben Enis [4] have incorporated well a multi-media approach into large lecture classes; however, such efforts are the exception rather than the rule.

Computers have been available on college campuses for more than two decades. Still, many of our colleagues make absolutely no use of them in the organization and execution of their teaching. The reasons for this failure to adopt are understandable but not excusable. First, there is the situation of the tenured associate or full professor whose graduate training did not include appreciable computer education. The motivation to change is negatively affected by job security, inertia, ego-defense mechanisms) and perhaps even a certain degree of fear of the hardware. Next, there is the university computer center syndrome which refers to the alienation often generated by university computer personnel for their machine and its systems as a function of a lack of user-orientation. Finally, there is the paucity of computer programs, beyond statistical analysis packages, available for use. Thus, expecting the megatrends cited by Naisbitt [9] to have a profound effect on business teaching is probably very naive. An interesting and, at the same time, frightening prospect is that businesses will undoubtedly embrace computer-based operation more so than the general public. In effect, a critical widening of education and practice can be anticipated with business education the laggard in this area. Yet it may be valuable to speculate about what might take place in the future.

Our view is that megatrends #1 (We are in a "megashift" from an industrial to an information-based society), #2 (For every high-technology action, there is a "high-touch reaction, or the technology will be rejected), #3 (We are moving from hierarchies to networking), #4 (the computer is smashing the pyramid), and #5 (We no longer live in an either/or, chocolate-or-vanilla world, people have demanded and are getting a multitude of choices) are the most pertinent in terms of affecting pedagogies used in business teaching. Consequently, our comments will be limited to those megatrends.

TREND #1: SHIFT TO INFORMATION BASED SOCIETY

As our traditionally strong manufacturing base gradually moves to areas of the world where labor is cheaper, our economy has become much more services oriented. Naisbitt [9] contends that the

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big growth will be in the production and/or processing of information. "High Technology" has become the buzzword of politicians throughout the country, as they see the success of areas such as the Silicon Valley in California, Route 128 outside Boston, the Research Triangle in North Carolina, and the build-up of computer-based technology in Austin, Texas. While certain areas appear to be flourishing, there are those who believe that the push for high technology is being oversold [7]. Government figures show that high-tech industries--defined as those with high expenditures on research and with a high proportion of scientists and engineers in their work forces--provided only 3.2% of jobs in 1982. This is not impressive when you consider that this share of the work force was 6.1% in 1972.

Whether high technology proves to be the economic savior predicted by many or not, it is clear that we can expect an explosion of hardware possibilities being incorporated into the university environment. Some of this has been fostered by the sheer availability of new products, but the explosion has picked up speed since the price of hardware has decreased. Also, many universities have been the recipients of hardware donated by computer manufacturers. For example, DEC and IBM teamed up to donate \$50 million of hardware and support services to MIT for a campus wide experiment. And Apple has donated 50 of its new Lisa personal computers, worth \$500,000, to Brown University. Tandy's Radio Shack subsidiary and Texas Instruments have donated hardware to universities in the Dallas-Fort Worth area. To the same end, schools such as Clarkson and Carnegie-Mellon are requiring all entering freshmen to purchase their own personal computers. Thus, it appears that the availability of hardware, which has been a serious problem in the past, may become a minor problem at many universities.

Expanded hardware capabilities will allow simulation gaming to take on several new forms. Many researchers have made projections as to the impact of personal computers on classroom teaching (for example, see [1], [2], [5], and [6]). Software for microcomputers is becoming much, much more common, although there are still severe problems of transportability due to the large number of manufacturers and the limited interchangeability of most of the software. Standardization is becoming more common, and it is foreseeable that a diskette containing a copy of a program designed for an Atari system may be easily usable on an Apple or an IBM personal computer. Whether the software is transportable or not though, the greater accessibility of hardware will still allow faculty to design packages for their own systems. The many benefits cited elsewhere for the use of microcomputers (immediate response, independence from mainframe downtime, etc.) will stimulate the development of a number of smaller simulations. Administratively, many instructors may prefer the distribution of a unique diskette to each student rather than the assignment of a unique computer number (which can require much interaction with computer center personnel in terms of creating a large number of files and then copying the program into the files). Clearly, the trend toward the increased use of microcomputers with computer simulations in the classroom is evident in the ABSEL membership, as evidenced by the papers of members such as Biggs, Burns and Fritzsche. Given the length of time between program development and its subsequent description in a publication, it is safe to say that many other ABSELers have developed computer simulations which are usable on micros. But, we believe that we are only seeing the tip of the iceberg, and that the

availability of reliable and enjoyable software for business teaching will become common.

The greater availability of computer hardware and improvements in software will also have profound effects upon simulation gaming done through the use of mainframe computers. Currently, the vast majority of simulation games are of the fixed-time format. As Chiesel [3] pointed out, there is a tremendous future for time-flexible interactive business games which allow the player to interact both with the computer and with other class members. Rather than the typical situation in which all players turn in decisions at one time and then the simulation is run, time-flexible games allow the class period to represent the duration of the game (be it six months or 20 years). Further, through indirect file access, a player can keep track of other players' decisions, and the decision environment at any given point in time reflects all decisions made to date. We agree wholeheartedly with Chiesel [1] that time-flexible decisions may make fixed-format games obsolete.

Viewed in the context of Megatrend #1, the proliferation of microcomputers, both university-owned and student-owned, boils down to an increased ability to handle more, complex information. Spreadsheet programs, financial ratio generators, forecasting and statistical methods will be everyday tools. In the short run, probably the most useful skill we can teach our students will be data base management where they become comfortable with confronting, assessing, processing, extrapolating, and making decisions based on multiple factors. In the long run, it is conceivable that the entire concept of decision making under uncertainty may be drastically altered because of reduced information float and more confidence in analytical methods.

TREND #2: THE NEED FOR HIGH-TOUCH TO MATCH HIGH-TECH

ABSEL participants have recognized this trend for many years, as many of us have expressed frustration with our colleagues for not using techniques which we have introduced to them and with our students for not always accepting our techniques with open arms. It may be that some of us are more interested in the high-tech (i.e., simulation design) aspects than we are in the high-touch (i.e., proper implementation) aspects.

The need for high-touch in the implementation of computer-based learning will probably grow tremendously in the short run. The sudden availability of hardware will make for a plentitude of applications; clearly instructors, especially those who are also game designers, need to spend a great deal of time providing guidance to the student novice. However, the long-run looks much more promising, in that we can expect the student in the year 1990 (or at least the student in the year 2000) to have experience with computers. As computers become common in elementary schools, the fear of the computer will fade away. To be sure, business gaming will become more sophisticated; however, we will not be faced with the problem of students who want nothing to do with the computer. Students will continue to have to learn how to play the game first before this can learn the substantive material from the game. But students experienced in interacting with computers will not face the high initial frustration level that current students do.

It is interesting to note that our more "participative" pedagogies are largely devoid of hightouch. Case studies and experiential exercises help students to apply material in a realistic context, but unless the instructor is greatly involved in the activity, it is just another task assigned to be carried out. Most computer simulations, be they mainframe, micro, or whatever, are stark representations of balance sheets, profit and loss statements, and market research

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information. The absence of high touch is especially apparent to one author who has worked with an Executive Development Program for the past five years. Participants play a computer game for two weeks, and involvement runs at a high level. The last few decisions are matched with a crescendo of excitement up to the determination of the winning company-team--which gets the pot of side bets put up by all teams. The participants created their own reward system. "Ordinary" students obviously will not follow suit; consequently, it is up to the implementer to generate excitement which antes up the stakes, so to speak.

TRENDS #1, 8, AND 10: THE SHIFT TO DECISION SUPPORT SYSTEMS

For years, people have heralded the movement toward management information systems (MIS), data-based management (DBM), decision support systems (DSS), or whatever you want to call the use of the computer in data storage, data retrieval, and decision making. It is safe to say that computer-based information acquisition and information processing is now a very real force in business decision making. Trends #1 (the shift from an industrial to an information-based society), #8 (the move from hierarchies to networking), and #10 (the greater demand for choices) indicate that the movement toward MIS, DBM, or DSS (for purposes of brevity, we will refer to DSS from now on) will continue and will probably accelerate. We alluded to these eventualities earlier; however) the trends also suggest specific changes that will likely occur in business teaching.

The most likely change will be a much greater emphasis on DSS in business curricula in general. Although systems-oriented materials and simulation gaming are both types of computer-based instruction, some view them as very distinct methodologies. In situations in which they are viewed as being distinct and in which computer resources are not abundant, the growth of DSS may come at the expense of simulation gaming. But there are many situations in which the two techniques interface quite closely. For example, Jolly [8] discussed two exercises which she developed for the purpose of introducing merchandising students to interactive planning and inventory management in a retail setting. While the students did not compete with one another in a dynamic fashion, the exercises clearly involved simulation aspects and sensitivity analysis. Similarly, Sharda and Gentry [11] discussed the use of the Interactive Financial Planning System (IFPS) in a case covering competitive bidding. This package is one of the most popular DSS programs (in fact, EXECLJCOM, the marketer of IFPS, is the major corporate sponsor of the International Decision Support Systems Conferences). Again, this package does not incorporate gaming aspects which allow one to compete with others dynamically, but it can be used easily in a simulation mode and one of its most marketable features is the ease with which sensitivity analysis can be performed.

The growth of DSS would seem to be undeniable. Whether it affects the nature of simulation gaming is less clear. However, we predict that uses such as the ones discussed at last year's conference by Jolly [8] and Sharda and Gentry [11] will become even more common. To many, simulation gaming" has meant the use of large batch games played for a semester duration and involving decisions made by all class members. We may well see a shift to a perception of simulation games" that is more individual in nature: the student interacts with the

computer to extract data, to perform analyses on the data, and to make decisions in a simulated environment.

Larger, whole-class-oriented games will not disappear. However, we will see changes in the structure of them. As manufacturing declines and service industries grow, the subject matter of most business policy, most marketing games, and most production games will become less relevant. We predict that we will see more games developed to model service industries in the future.

DISCUSSION

Speculating on the future of business instruction is an enjoyable pastime. The megatrends cited by Naisbitt [9] will affect our approach to teaching; the question of concern is how. We have discussed some possible changes. Computer hardware is becoming more available and new, more exciting software is on its way. The potential is almost unlimited. However, as we discussed in the introduction to our paper, we are cynical as to the amount of change that will take place in business instruction. We believe that the safest prediction is that much of our classroom instruction in the future will still involve the lecture-test format unless educators swing from a reactive to a proactive mode.

What are the requirements to assume a proactive stance with regard to the effects of these Megatrends on simulation gaming? We envision a number of responsibilities incumbent upon ABSEL members who agree with our claims. There are more, of course, but, for the purpose of thought generation, we will list and discuss four.

1. Doctoral Education. Most doctoral programs with which we are acquainted completely fail to provide candidates with any pedagogical or even basic education training whatsoever. (It is only by haphazard circumstances that we experienced one such course, ourselves. Frankly, we protested at the time.) It is appalling to realize that the primary activity of a business educator is completely unaddressed in his/her doctoral education. When possible, we have the responsibility of acquainting them with alternative pedagogies and relating to them the relative merits and disadvantages of each. Ideally, this activity should be a formal aspect of their education, but, given circumstances and other factors, a short run solution can take the shape of seminars, role modeling, information discussion, counseling, and other unstructured forms. ABSEL has the opportunity to take the initiative and to develop a monograph, perhaps to be published by Sage, targeted at the doctoral student in business.

2. Faculty Education. Despite our earlier comments detailing reasons for reluctance on the part of less enlightened faculty members to adopt the more participative teaching methods, it is worthwhile to attempt to reach them. perhaps a reasonable approach is to deal one on one when you and another faculty member teach the same course. here, you can volunteer to help him/her adopt the methods you are using in your sections. A more subtle approach might be to engage a colleague in the coauthorship of a pedagogical research paper. We have witnessed limited success where faculty members are compelled to participate in teaching methods seminars; consequently, the options which come to mind are generally informal tactics.

3. Simulation Gaming Implementation. Our observation as to the general absence of high touch leads to a recommendation that implementers be sensitive to Naisbitt's claims of the necessary pairing of high touch with high tech. As we noted, the swing to high tech in business education will be essentially a hardware acquisition phenomenon. Students will be increasingly positioned

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on the other side of a monitor, printout, or other impersonal communication device. The responsibility which accompanies this situation involves the restructuring of reward systems. Multifaceted feedback seems essential to forestall negativism which might eventuate from a strictly high tech approach. It is important to note that students cannot "reject" technology in the same sense as Naisbitt discusses this reaction. But this can come away from the experience with negative emotional reactions not unlike those seen from aversion therapy.

4. Student/Participant Initiative. Most approaches to business education harbor an assumption of passiveness on the part of the student. Lumped together, the Mega trends considered in this paper suggest that society will have more and more opportunity to anticipate and plan for eventualities. (The whole point of Naisbitt's book is to help us understand and prepare for the future.) Therefore, it seems appropriate to claim that a fourth responsibility falling on our shoulders is to begin operating on the promise of increased initiative. We can expect our students to be more inquisitive, more questioning, more analytical, and more critical. They will be increasingly more responsive to operating with large databases and less tolerant of information lag. They will probably be able to operate with less structure and more creativity. In short, we have a responsibility to provide them with stimuli in a context consistent with this maturity.

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