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A STATISTICAL ANALYSIS OF SIMULATION USERS: RELATIONSHIPS BETWEEN STRESS AND HUMAN SUBJECTS GUIDELINES

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ABSTRACT

This paper presents the results of a survey concerning the H.E.W. Human Subjects Guidelines. A questionnaire was sent to each present and former ABSEL member. Three dimensions were considered in the survey and the paper: member's awareness, opinions, and actions or intended actions to the Guidelines. Frequency distributions and open-ended responses are presented. The results indicate the diversity of present and former ABSEL members with respect to these three dimensions.

Introduction

This paper analyzes the results of a Human Subjects Issue Survey which was mailed to all present and former ABSEL members. The paper is, in part, based upon the works of Faria and Nulsen (1), Strang, Crino, and Pray (3), and Sewall (2). Faria and Nulsen (1: 25) have described the rapid growth and popularity of business (ongoing work group type) simulations and conclude that "the business simulation has become a very important element within the curriculum of many business schools." Strang, Crino, and Pray recently reported research in which they concluded that a relevant and major cost of simulation usage in management courses was the frustration and stress levels induced in student participants by these simulations. Their (3: 174) data suggest three underlying sources of stress and frustration: interpersonal conflict, difficulty in understanding interrelationships embodied within the simulation itself, and administrative and clerical problems (keypunch, etc.) associated with simulation usage. In some instances these frustrations and stresses induced students to withdraw from the simulation; in others, withdrawal from the course resulted.

Sewall recognized the potential for such frustration and stress in his recent literature review. He noted that the Human Subject Guidelines might be an appropriate guide to simulation usage if research is conducted which employs simulation techniques. It should be noted that the purpose of the review process of the Department of Health, Education, and Welfare (4 136) for human subjects is to protect the interests of individuals "who may be exposed to the possibility of injury, including physical, psychological, or social injury, as a consequence of participation as a subject in any research, development, or related activity." Sewall's review of relevant ABSEL literature noted that a number of papers involved manipulation of the psychological environment of students; thus, questions surrounding psychological and social risk may be relevant to instructional methods, as well as simulations used

for research purposes. He (2: 286) has stated that "ABSEL members are encouraged to consider and debate the policy issues involved."

Purpose

The intent of this paper is to present and analyze the position of the present and former ABSEL members concerning this Human Subjects Issue as it applies to classroom simulations. It addresses three separate but not mutually exclusive dimensions: (i) the member's awareness of the Human Subjects Guidelines, (ii) their opinions concerning the relevancy of the Guidelines to simulation users, and (iii) their actions and intended actions taken in response to the Guidelines. No a priori hypotheses were established. The intent of the research was primarily that of information gathering, tentative analysis, and dissemination of findings.

Methodology

A questionnaire was developed and administered by the authors in order to ascertain the position of present and former ABSEL members regarding this Human Subjects Issue. The questionnaire itself consisted of twelve discrete-answer questions and one open-ended question. It was sent to each present and former ABSEL member listed in the 1977 Directory of ABSEL Members. Of the 322 questionnaires sent to members in the United States, 126 usable responses were received - a response rate of 39 percent. Thirty-seven states and the District of Columbia were represented.

The raw data from the returned questionnaires were analyzed by the use of frequency distributions. The section below summarizes the most pertinent responses. The questionnaire is presented in the appendix.

Results

As noted in Table 1, the members are overwhelmingly committed to the use of computerized and noncomputerized ongoing work group type simulations. Faria and Nulsen (1: 25) report a similar result. The responses indicate that a majority of the members are regular simulation users of the computerized variety. Most users (62%) indicate an exclusive concern for simulation as a teaching tool. A significant number (40), however, utilize simulations in the classroom with the intent of extending their research, as well as for pedagogical applications. Interestingly, those who utilize simulations for both research and teaching report that teaching constitutes a major component (about 80%) of their usage.

Insights into Experiential Pedagogy, Volume 6, 1979

TABLE 1
FREQUENCY ANALYSIS OF USING, USES,
AND TYPES OF SIMULATION EMPLOYED

Question	Possible Response	Frequency	Percentage Responses
1. Have you ever used an ongoing work group simulation in classroom teaching? (Quest. #2)	Yes	113	89.7%
	No	13	10.3%
2. Would you classify yourself as: (Quest. #3)	Regular User	74	58.1%
	Occasional User	41	32.3%
	A Previous User (discontinued)	5	4.0%
	A Non-User	6	4.8%
3. If you use simulation of the ongoing work group type, which of the following best describes the simulation(s)? (Quest. #4)	Computerized	56	45.5%
	Noncomputerized	26	21.1%
	Both	32	26.0%
	Does Not Apply	9	7.1%
4. If you are a simulation user, how would you best characterize your present use? (Quest. #5)	Exclusively for Teaching	77	62.1%
	Exclusively for Research	1	.8%
	Both Teaching and Research	40	32.3%
	Does Not Apply	6	4.8%
5. If you use simulations for research and teaching, what percentage is for teaching? (Quest. #5a)	< 50%	10	25.0%
	50%	16	40.0%
	55%	7	5.0%
	90%	8	20.0%
	95%	4	10.0%

Table 2 summarizes the responses of the ABSEL members to questions concerning the Human Subjects Guidelines. As might be expected a priori, the majority (67.5%) of the users had not considered simulations to be under the purview of the Department of H.E.W. Human Subjects Guidelines. Furthermore, a significant portion (47.6%) were either not aware of having a campus-wide human subjects officer or knew their campus did not have one. An overwhelming 77.4 percent of the membership felt the use of simulations for classroom usage was not under the purview of the H.E.W. Guidelines. Only fifty-five percent felt that computerized ongoing work group type simulations for both pedagogical uses and for research should be under the Human Subjects Guidelines. This latter response suggests in the form of directionality, that research oriented simulation usage may in fact be considered for H.E.W. Guidelines¹

In summary, most of the ABSEL members who actively use simulations felt that simulation usage either strictly for teaching or for both teaching and research, does not warrant concern for stress and Human Subjects Guidelines. These actual unintended actions reflect this attitude. In fact, 72.6% indicated that they intend to take no action.

¹ It should be noted however, that the SPSS cross tabs revealed that while only 26% of simulation users (strictly for pedagogical purposes) had considered the issue, 42% of the simulation users (for both teaching and research) had considered the issue.

TABLE 2
HUMAN SUBJECTS GUIDELINES, DOMAIN
AND CONCERN FOR THE GUIDELINES

Question	Possible Response	Frequency	Percentage Responses
1. Have you considered the issue? (Quest. #6)	Yes	41	32.3%
	No	85	67.5%
2. Human Subjects Office or Committee on Campus? (Quest. #7)	Yes	65	52.4%
	No	19	15.3%
	I don't know	40	32.3%
3. Under domain when used exclusively for teaching? (Quest. #8)	Yes	9	7.3%
	No	96	77.4%
	I have no opinion	19	15.3%
4. Under Domain when used for teaching and research? (Quest. #9)	Yes	37	30.1%
	No	68	55.3%
	I have no opinion	18	14.6%
5. Personal Position (Quest. #10)	Cleared Use	3	2.4%
	Plan to Investigate	16	12.9%
	No Plans to Check	90	72.6%
	Discontinued Use	8	6.5%
	Do Not Use Simulation	7	5.6%

Table 3 summarizes the members' ranking of stress associated with a number of teaching techniques. As would be expected, examinations and oral presentations are the highest in terms of stress while homework and cases are the lowest. Simulation usage has an average stress level equivalent to cases or papers. Interestingly, the ABSEL members who use simulations for research purposes indicated a higher level of stress associated with its usage than did the members who use it for teaching purposes strictly.

TABLE 3
RANKING OF TRADITIONAL TEACHING
TOOLS IN TERMS OF STRESS

Method	All Users		Teaching Only		Teaching and Research	
	Mean	(SD)*	Mean	(SD)	Mean	(SD)
Cases	4.1	(1.4)	4.2	(1.5)	4.0	(1.5)
Examinations	5.9	(1.2)	6.1	(1.1)	6.0	(.96)
Homework	3.0	(1.3)	2.9	(1.4)	3.2	(1.4)
Oral Pres.	5.7	(1.0)	5.7	(1.0)	5.7	(.98)
Papers	4.7	(1.1)	4.8	(1.3)	4.4	(1.2)
Simulations	4.3	(1.2)	4.1	(1.2)	4.4	(1.2)

*(SD) is the standard deviation.

Comments of Respondents

Often the discrete categorical answers fail to capture the intensity of feeling of survey respondents. The following sample of open-ended comments is intended to reveal the diversity and intensity of attitudes and opinions held by the members. The comments are grouped under the general headings of stress, opinion, and miscellaneous.

Stress:

All classes have some stress.

No harm to student, if properly executed.

Stress is a part of living and growing. Who will protect the student from stress when he enters the real world???

Students usually enjoy games and stress is hardly more than homework.

Cases/tests/oral presentations offer as much if not more stress than a business game simulation.

Insights into Experiential Pedagogy, Volume 6, 1979

No significant risk to the participants.

Any stress imposed is no different than that which the students will face in the real world. If they find out they cannot handle it, we are doing them a favor by making them aware of this fact. They can then adjust their career plans accordingly.

Simulations create no more stress than other teaching methods.

Real life is filled with far more stress than any simulation used in my classes or research. It is far better to learn to cope with simulated catastrophes than to get hit with real disaster because of failure to learn earlier.

My American Heritage dictionary says "stress" is an emphasis made which is emotionally disquieting. It is the change agent or force of learning. Therefore, the answer to question 11 lies in the syllabus of an instructor rather than in the inherent nature of the method itself. (e.g. I could assign "Stress" to any or all methods to obtain various objectives in various courses.)

Students face a variety of stress -- why isolate simulation?

The stress involved is not great enough relative to normal class stress.

Compare to taking exam, participating in discussion, etc. How much stress is developed in these?

Stress more likely a function of the individual. than the teaching technique.

Stress is a personal thing. This can not and should not be quantified.

What are the Human Subjects Guidelines?

Possibly, if the research simulation crosses ethical boundaries with respect to stress in subjects.

The presence of stress is not, ipso facto, something to be deplored/avoided.

How ridiculous to presume that "Stress" falls within the act. All of life is stress -- all education is stress. If the stupid bureaucrats win on this one we are all in trouble as a society.

When you add research you may be crossing some sort of line. I don't believe so, but I can see an argument emerging for research.

I believe that stress is a positive benefit to the student.

A pedagogical choice much as tests; cases; small group discussions are pedagogical devices. I don't believe the courts will interfere with professional judgments on the choice of pedagogy unless flagrantly out of line with reality.

The whole idea is a bureaucratic waste. There is nothing here to

waste time or money on. The students don't need protection against this type of stress, because it merely simulates the same stress they must encounter later as employees.

If stress is eliminated from the classroom situation, motivation will also cease. Part of this job in the Business School is to allow the students to experience the signs of real-life decision making, including stress. The university atmosphere is unreal enough, why turn it into a true make-believe world?

To think that simulation stress is a serious matter that might require H.E.W. intervention is either a little funny or a little frightening, I'm not sure which

If it falls under the domain of Human Subjects legislation, the whole of teaching does also.

No real invasion of privacy, etc. and no specific revelation of individual "frailties".

Miscellaneous:

Each of these affect different students in different ways -- I've had students come close to nervous breakdowns over having to answer a question in class, so my responses are tenuously generalized.

Simulations are designed to provide students with real life experience. One should not follow overly protective patterns which preclude active learning experiences.

Students are not subjects but the doers.

Government simply cannot control everything.

"Stress" as risk is stupid. All life is stress.

Fight it. This is an example of intent of law being abused by the enforcers.

Conclusions

As noted by Faria and Nulsen (1: 25), there appears to be extensive usage of the ongoing work group type simulation across ABSEL members. The work of Strang, Crino, and Pray (3) suggested that stress placed upon students in the simulation environment is a "cost" considered in determining the benefits/cost of simulation. Sewall (2) suggested the possibility of H.E.W. Guidelines being appropriate for simulation usage particularly in the research area. The findings of this survey indicate that an overwhelming majority of active simulation users for teaching purposes feel that (i) simulations do not generate sufficient stress and (ii) therefore do not fall under the purview of the Human Subjects Guidelines.

One survey respondent said with respect to the implications of the Guidelines, "I'll cross that bridge when I come to it." Sewall (2: 286) astutely urged the membership to consider and debate the policy implications of this crucial issue. Perhaps, the profession has arrived at the proverbial bridge and the time has come for ABSEL to take a position.

Insights into Experiential Pedagogy, Volume 6, 1979

APPENDIX

QUESTIONNAIRE

1. In which state is your institution located? _____
2. Have you ever used an ongoing workgroup simulation in classroom teaching?
 - (A) Yes
 - (B) No
 - (C) I do not teach (I have not taught).
3. Would you classify yourself as:
 - (A) a regular simulation user?
 - (B) an occasional user?
 - (C) a previous user who has discontinued usage?
 - (D) a non-user?
4. If you use simulations of the ongoing workgroup type, which of the following best describes the simulation(s)?
 - (A) Computerized
 - (B) Non-computerized
 - (C) Both computerized and noncomputerized
 - (D) Does not apply.
5. If you are a simulation user, how would you best characterize your present use?
 - (A) Exclusively for teaching
 - (B) Exclusively for research
 - (C) Both teaching (____%) and research (____%)
 - (D) Does not apply.
6. It has been suggested that the use of simulations may fall under the purview of the Department of Health, Education, and Welfare rulings concerning Human Subjects because of the possible stress imposed upon students (subjects). Have you ever considered this issue?
 - (A) Yes
 - (B) No
7. Do you have a Human Subjects officer or committee on your campus?
 - (A) Yes
 - (B) No
 - (C) I don't know.
8. Do you personally feel that the use of simulations for classroom use exclusively falls under the domain of Human Subjects legislation?
 - (A) Yes. Why? _____
 - (B) No. Why not? _____
 - (C) I have no opinion.
9. Do you personally feel that the use of simulations for both classroom and research purposes falls under the domain of Human Subjects legislation?
 - (A) Yes. Why? _____
 - (B) No. Why not? _____
 - (C) I have no opinion.
10. Which of the responses below most accurately describes your own personal position concerning the use of simulations and its possible relationship to human Subjects legislation?
 - (A) I have cleared my use of simulations with the Human Subjects committee or officer on my campus.
 - (B) I plan to investigate the ruling further for possible action later.
 - (C) I have no plans to check with the Human Subjects officer or committee on my campus because a check is not necessary.
 - (D) I have discontinued simulation use because of the stress imposed on students.
 - (E) I do not use simulations.
 - (F) Other; please specify: _____
11. Please categorize your opinion of the stress associated with each of the following teaching methods (circle the appropriate number):

Method	Low Stress			Average Stress			High Stress		
Cases	1	2	3	4	5	6	7	Does Not Apply	
Examinations	1	2	3	4	5	6	7	Does Not Apply	
Homework	1	2	3	4	5	6	7	Does Not Apply	
Oral Presentations	1	2	3	4	5	6	7	Does Not Apply	
Papers	1	2	3	4	5	6	7	Does Not Apply	
Simulations	1	2	3	4	5	6	7	Does Not Apply	
12. Please use the space below to inform us of any further comments, remarks, or thoughts about simulations, stress, and the Human Subjects issue in general.

Thank you once again.

REFERENCES

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