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AN ASSESSMENT OF THE EFFECT OF EXPERIENTIAL, SIMULATION AND DISCUSSION PEDAGOLOGIES USED IN LABORATORY SECTIONS OF AN INTRODUCTORY MANAGEMENT COURSE

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ABSTRACT

This paper examines the influence of three different teaching methodologies upon students' cognitive learning, problem- solving skill development, perceived learning and satisfaction. Approximately 500 students in an introductory management course were randomly assigned to laboratory sections in which an experiential, simulation or discussion method of instruction was utilized. One-way analysis of variance identified significant differences between the students in the six discussion, the five simulation, and the five experiential sections. Perceived learning levels and satisfaction levels were found to differ significantly between teaching methodologies, while no statistically significant differences were found between the three experimental groups on cognitive learning or problem-solving skill development.

INTRODUCTION

Concern for the efficiency and effectiveness of various teaching methodologies has contributed to the development of an extensive research literature which unfortunately is filled with incongruencies. Although some professors will persist in believing that one method of instruction is superior to another, it would seem that attention may be more appropriately focused at building models of the learning-teaching processes in which pedagogy is only one input into the process.

Research efforts seeking to identify the "best" way to teach students a specific subject matter are not new. [7] [2] Although traditional instructional methods of lecture and discussion remain the main stay of most college instruction, the use of simulations and more recently the development of experiential approaches to teaching have attracted increasing research interest.

The impact of business games on learning has been extensively reviewed by Keys. [8] While reporting finds favorable and un favorable attitudes toward simulations, Keys concluded that in the teaching of business policy concepts the use of both cases and games appeared to be superior to either approach alone. The mixture of teaching methods seems to be supportive of what Byrne and Wolfe [3] suggest as a repetitive cycle c)f learning present

in the experiential process. The learner first engages in some concrete experience which leads to reflective observation from which the learner inductively derives abstract concepts and generalizations. Once formed these conceptualizations lead deductively to new hypotheses and new responses which will be tested by new concrete experiences that will initiate the cycle again.

Explanations as to why simulations and experiential techniques have become accepted pedagogical techniques focus upon the greater degree to which a student is actively involved and participating in the learning process as well as the almost immediate feedback concerning the results of their action. [6] [4] Some researchers have, however, suggested that general principles may not receive sufficient attention and that the increased involvement and time demands may result in less effort being de voted to other learning activities. [11] Cherryholmes [51 concluded after a critique of a number of studies, that while games do motivate students, there is little evidence that they teach cognitive material or problem-solving skills, or that they in duce critical thinking any more effectively than other methods of learning.

The purpose of this paper is to investigate the association between instructional method and students' cognitive learning, problem-solving skill development, perceived learning and satisfaction. The broad question being addressed in this paper is whether the students in laboratory sections using either discus sion, experiential or simulation pedagologies exhibit significantly different levels of learning or satisfaction.

METHOD

Subjects

The sample consisted of 503 college juniors and seniors en rolled in a basic Principles of Management course at Northern Illinois University. The students attended one of two lecture sections twice a week during the Spring Semester of 1976. Each student attended one of 16 available laboratory sections once a week. The focus of the study is on the laboratory sections which consisted of six sections using a discussion group instructional method, five sections using an experiential mode of instruction and five sections where a simulation was used for in struction.

The subjects were randomly placed in one of the sixteen lab oratory sections. The experimental treatment assigned to each section was determined to minimize the possible effect of perfect meeting times. A review of the demographic characteristics of the students in each treatment group indicated that the groups

differed significantly in only three areas. Students in the discussion group tend to be a little younger and the experiential group a little older. Discussion group students expected a some what lower grade in the course while those in experiential expected a higher grade. More accounting majors are in the experiential sections and fewer are in the discussion sections. No significant differences were found between the treatment groups with respect to learning style preferences or personality characteristics.

Measurements

During the first week of class the students completed the various assessment inventories and the pre-test examination and case analysis. Two versions of a comprehensive objective question final exam were developed as the measure of cognitive learn ing. Students attending the 9:00 a.m. lecture period answered version A as a pre-test and took version B as their post-test at the conclusion of the course while those in the second lecture period at 11:00 a.m. took version B as their pre-test and version A as their post-test. The difference between a student's pre test and post-test scores was used as the measure of their cognitive learning. The same procedure was used with a pre and post case analysis completed in class. Differences between scores provided the measure of problem-solving skill development achieved by the student. No additional case exercises were used in any of the laboratory sections or in the lecture. All cases were graded anonymously and grade consistency was verified by regrading a randomly selected sample.

While responses to examination questions and written cases provided relatively objective measures of learning, the perceptions of the student as to what was learned is also an important aspect in the total learning process. If students experiencing certain instructional methods perceive greater opportunities to satisfy human needs than students using other instructional methods, the writings of Maslow [10], Argyris [1], and McGregor [9] seem to project a resulting relatively higher motivation level with accompanying increases in related student productivity, i.e., learning.

At the conclusion of the course measures of perceived learning and satisfaction were obtained from student responses to a course evaluation form using a seven point Likert scale with low numbers being associated with positive responses and high numbers, negative responses. These forms were completed anonymously except for identification of the students' laboratory section number. The following four questions were used as measures of perceived learning:

1. Did you learn more or less in this course than other courses?
2. The laboratory section helped to develop my managerial skills?
3. The laboratory section assisted in integrating the course material?
4. Did you learn more or less from your laboratory section than from similar experiences?

The six questions used to assess the students' satisfaction with the course and their laboratory section are the following:

1. Were you motivated to work more in this course than in more traditional courses?
2. Did you enjoy this course more than other courses?
3. Overall I am highly satisfied with my experience in this course this semester.
4. There was ample opportunity to get the feeling of worthwhile accomplishment in my laboratory section.
5. Were you more motivated to work in your laboratory section than in similar experiences?
6. Did you enjoy your laboratory section more than similar experiences?

An additional measure of individual satisfaction or at least participation in the course was obtained from lecture and laboratory attendance records. Students were advised that attendance records were being maintained but no points would be subtracted or added for attendance.

RESULTS

Cognitive Learning and Problem-Solving Skill Development

To determine whether the different instructional methods influenced cognitive learning, the difference between the pre and post test results of the students were analyzed. The results of analysis of variance (ANOVA) for cognitive learning (Table 1) and for problem-solving skill development (Table 2) show no significant differences among the groups. Examination of mean data (Table 3)[1] indicates that the students in discussion group laboratory sections had somewhat higher levels of cognitive learning, while students in the simulation sections had higher scores on problem-solving skill development. Students in the experiential laboratory sections showed the least change in both cognitive

[1] Mean Score Tables may be obtained from the authors upon request, i.e., Tables 3, 5, 7.

learning and problem-solving skill development. In terms of knowledge and skill the results indicate that the instructional method used in the laboratory section had no significant effect on levels of learning as measured by performance on an objective question examination and an in class written case.

TABLE 1
ANOVA: Cognitive learning

Source	DF	SS	MS	F ratio
Between Groups	2	48.00	24.00	0.54
Within Groups	470	20734.75	44.11	
Total	472	20782.75		

TABLE 2
ANOVA: Problem-Solving Skill Development

Source	DF	SS	MS	F ratio
Between Groups	2	9.57	4.79	0.69
Within Groups	384	2649.87	6.90	
Total	386	2659.44		

Perceived Learning

Analysis of the responses to the four questions reflecting perceived learning shown in Table 4 indicates that while no significant difference in perceived learning was found concerning the amount the student felt he learned in the course, significant differences between the groups concerning their laboratory learning were found. In Table 5,[2] the mean scores and standard deviations associated with the four questions for the three different types of laboratory sections are presented. Students in the simulation sections perceived that their laboratory experiences helped to develop their managerial skills more (x=3.95) than did the students in the discussion section (x=4.50). The discussion type laboratory section assisted more in the integration of the course material (x=3.55), while the simulation sections aided integration the least (x=4.85). However, when asked if they learned more or less from their laboratory section, students in the simulation sections responded more positively (x= 3.72) than the discussion section students (x=4.44). The experi-

[2] Mean Score Tables may be obtained from the authors upon request, i.e., Tables 3, 5, 7.

ential section students on all three of the questions associated with perceptions concerning their laboratory section tended to have average responses somewhere between the simulation and discussion groups.

TABLE 4
ANOVA: Perceived Learning

Question	Source	DF	SS	MS	F ratio
Learn more or less In this course	Between Groups	2	5.16	2.58	1.55
	Within Groups	318	528.67	1.66	
	Total	320	533.83		
Lab section developed managerial skills	Between Groups	2	9.57	4.79	0.69
	Within Groups	384	2649.87	6.90	
	Total	386	2659.44		
Lab section assisted in integration of material	Between Groups	2	9.57	4.79	0.69
	Within Groups	384	2649.87	6.90	
	Total	386	2659.44		
Learn more or less in lab section	Between Groups	2	9.57	4.79	0.69
	Within Groups	384	2649.87	6.90	
	Total	386	2659.44		

Satisfaction

The ANOVA results presented in Table 6 show that the groups did not differ significantly regarding their feelings of satisfaction concerning the overall course, but again significant differences were found in satisfaction levels associated with the laboratory experience. Reviewing the mean scores found in Table 7,[3] it may be seen that the simulation group tended to believe that they had more of an opportunity to get the feeling of worth while accomplishment (x=3.18) than the discussion group (x=4.60). The simulation groups were more motivated to work in their laboratory sections (x=3.64) than either the experiential groups (x=3.74) or the discussion groups (x=4.61). Both the simulation group (x=3.41) and the experiential group (x=3.60) tended to en joy their laboratory sections more than the discussion groups (x=4.76). Although the groups did not differ significantly in their absences from lecture, students in the simulation section

[3] Mean Score Tables may be obtained from the authors upon request, i.e., Tables 3, 5, 7.

groups had fewer lecture absences (x=3.76) than either the discussion groups (x=4.32) or the experiential group &=4.60). Absences from the laboratory sections were significantly different with the discussion group having the highest average absence level (x=1.68) and the simulation group the lowest (x=1.02), with the experiential groups' absences falling in between these two groups (5r=l.36).

TABLE 6
ANOVA: Satisfaction

Question	Source	DF	SS	MS	F ratio
Motivated to work in this course	Between Groups	2	0.14	0.07	0.04
	Within Groups	318	507.24	1.59	
	Total	320	507.39		
Did you enjoy this course	Between Groups	2	3.86	1.93	0.86
	Within Groups	318	711.63	2.23	
	Total	320	715.50		
Overall highly satisfied with course	Between Groups	2	11.71	5.85	2.49
	Within Groups	318	747.95	2.35	
	Total	320	759.66		
Feeling of accomplishment in lab section	Between Groups	2	104.58	52.29	20.24**
	Within Groups	318	821.41	2.58	
	Total	320	926.00		
More motivated to work in lab section	Between Groups	2	63.40	31.70	15.50**
	Within Groups	318	649.98	2.04	
	Total	320	713.39		
Did you enjoy the lab section	Between Groups	2	118.92	59.46	21.15**
	Within Groups	318	894.00	2.81	
	Total	320	1012.92		
Absence from lecture	Between Groups	2	56.72	28.36	1.56
	Within Groups	479	8696.89	18.15	
	Total	481	8753.62		
Absence from lab section	Between Groups	2	34.79	17.39	6.96**
	Within Groups	478	1193.59	2.49	
	Total	480	1228.38		

CONCLUSIONS

This paper has been an attempt to appraise the effect of three instructional methods on the performance of students in a required introductory management course. On the basis of the

findings reported here, it may be concluded that the laboratory section method of instruction had no significant effect on the students' performance in or satisfaction with the total course. The method of laboratory instruction, however, did result in significant difference in both the perceived learning and satisfaction levels of the students in the laboratory section. Al though one might hope that the positive laboratory section results associated with the less tradition al instructional methods of experiential exercises and business gaming might be strong enough to influence the total course results, this was not the case. On the other hand, it should be noted that these innovative techniques did not negatively effect the performance of the students in this course.

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