A COMPARISON OF PERCEIVED LEARNING IN THREE PEDAGOGICALLY DIFFERENT SECTIONS OF A REQUIRED BUSINESS POLICY COURSE

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In the past several years, there has been a growing interest among academicians about differences among students learning styles and preferences. Coupled with this is the growing diversity of teaching-learning methods. This paper reports a study of three sections of a single course, each using a different learning methodology. Measures of students' preferred learning styles and of their perceptions of their own learning were obtained. Comparisons were made between these two variables and with the section chosen by the students.

THE GRADUATE ADMINISTRATIVE SEMINAR

This course is offered as a required, three-hour course given during the second semester of a calendar-year-long MBA program. It follows a semester of required study in five functional areas of business. It is intended primarily as an integrative experience in which the student is able to obtain a broad yet penetrating perspective of the operation of the total enterprise. Students are assumed to have already obtained the basic knowledge and skills of the functional disciplines; further depth in these cognitive areas is not a primary purpose of this course. Specific learning objectives have been specified by the faculty as follows:

1. Students will be able to demonstrate their capability in assuming a top management perspective for the effective administration of the total enterprise.

2. Students will be able to demonstrate their capability in effectively diagnosing and resolving complex business problems.

3. Students will be able to demonstrate their capability in observing and understanding the business enterprise both as a collection of differentiated parts and as a total, integrated system. Further, they will demonstrate awareness 'and consideration of the enterprise in interaction with its environment.

4. Students will demonstrate awareness and consideration of the enterprise in interaction with its environment.

5. Students will be able to demonstrate their role effectiveness in working as a team member within a differentiated task team, especially with regard to readily providing and accepting the special skills, expertise, and information held by team members.

6. Students will be able to demonstrate their effectiveness in being aware of, seeking Out, and making use of resources available in accomplishing their task responsibilities.

Consistent with the broader philosophy of the MBA program, which encourages student choice and voluntary association, several alternatives are available for accomplishing these objectives.

PEDAGOGICAL ALTERNATIVES

Students were able to choose among three different teaching methods. There was a section utilizing a complex management simulation. An- other section provided lectures followed by a field experience. The third choice for students was a case method section. The second section followed the usual pattern for both curriculum and course design. Namely, that conceptual material was presented to students and their understanding of this material was verified by standard testing procedures. This was followed by an opportunity to test their understanding in a more complex environment, in this instance a field study. Given this description of the second alternative open to students we have chosen to call this the classical section.

OBJECTIVES OF THIS STUDY

There were two objectives for this study: (1) to determine the relationship, if any, of student learning styles to choice of section and amount of self-perceived student learning[1] and (2) to examine the relationship, if any, between the amount of perceived student learning and participation in one of the three different sections.

To test the relationship between learning style, section choice and learning we formulated two hypotheses:

> Hypothesis 1. The section chosen is related to individual preferred learning styles of students.
>
> Hypothesis 2. The amount of self-perceived student learning is related to individual learning styles of students, taken all together or by section.

To test the relationship of perceived student learning to participation in the three different sections of the course we formulated the following hypotheses:

> Hypothesis 3. There is a significant relationship between the amount of perceived student learning and the section chosen.
>
> Hypothesis 4. There is a significant difference in the average perceived total learning scores of students enrolled in the simulation, classical and case sections.

METHODOLOGY

At the outset of our discussion of the methodology of this study, it is important to note the pedagogical nature of the sections being

[1] The use of student perceptions of learning as a measure of learning is supported by Lunsden [8, p. 54].

compared. Each section involved a singular commitment to the stated pedagogy. Thus the simulation section[2] employed a complex simulation that served as the total learning environment. The instructors conducted two class meetings at the beginning of the semester to ex- plain the mechanics of the simulation and the course administration policies. A review session was also held at the end of the semester. The rest of the course was devoted entirely to the conduct of the simulation game. There were no examinations, classes, readings or cases. Grades were a combination of ranked team performance, peer evaluation and inputs from businessmen and faculty who comprised a board of directors for each team.

The classical section offered a lecture format with periodic testing based on two textbooks. After approximately half the semester, student teams worked with actual companies to describe, understand and evaluate the corporate planning function. Each team prepared and presented a report to the class on their findings.

The case section followed the normal pattern for this teaching method. A casebook was used as the basis for class discussion. Case writeups and oral presentations of a common case to a board of directors composed of faculty members were also employed.

Each section involved a team-teaching effort by two faculty members and they each taught only one section of this course. The faculty teams were very experienced in the pedagogy of their own section, and each had a strong preference for their method.

At the beginning of the semester every student in each of the three sections was given the learning style instrument. This instrument, developed by David Kolb [6] measures the learning style according to a conceptualization of the process of learning from experience. Kolb's four learning style classifications are labeled accommodator, diverger, assimilator and converger. Accommodators emphasize concrete experience and have an active rather than reflective orientation. Divergers have a preference for concrete experience and reflection as opposed to abstraction and action. Assimilators emphasize reflection and abstract conceptualization while convergers place relative emphasis on abstract conceptualization and a preference for active experimentation.

As a measure of learning, students in each section were administered an identical questionnaire at the end of the semester. This questionnaire used a Likert-type scale to ask students to (1) rate the extent to which the six course objectives were achieved and (2) the extent to which the course provided learning along eighteen different dimensions of learning. These eighteen dimensions were derived from the six, more broadly stated course objectives.

LEARNING STYLE AND SELECTION OF METHODOLOGY

Based on the expectation that students would tend to choose learning

[2] The simulation game used in this section is more fully described in Byrne and Wolfe [2, p. 22].

methodologies which are congruent with their own preferred learning styles, we have hypothesized that there would be a relationship between learning style and selection of course section. The results shown in TABLE 1 indicate that we must reject this hypothesis. It is clear that these are independent variables.

TABLE 1
CROSSTABULATION OF METHODOLOGY BY LEARNING STYLE

	Learning Style					Row
Methodology	Balanced	Diverger	Assimilator	Converger	Accommodator	Total
Section	1.	2.	3.	4.	5.	
1. Simulation	1 (1.8)*	4 (7.0)	9 (15.8)	32 (56.1)	11 (19.3)	57
2. Classical	0 (0)	3 (6.5)	9 (19.6)	26 (56.5)	8 (17.4)	46
3. Case	0 (0)	2 (4.7)	3 (7.0)	26 (60.5)	12 (27.9)	43
Column Total	1	9	21	84	31	146

Chi Square = 5.78897 with 8 df. p = .6709

*parentheses indicate row percentages

Although this finding is difficult to explain in light of the theory [7], we suggest that other factors and criteria appear to take precedence over learning style congruence when students make this decision at the time of registration. Discussions with students on this suggest that this decision tends to be based more on such factors as (1) prior contacts with the instructor, (2) rumors and myths in the student grapevine about the relative difficulty or time demands associated with each section, (3) the time of day the section is scheduled, (4) perceptions of the amount of structure provided, student initiative expected, or level of uncertainty to be encountered, and (5) student willingness to engage in an unfamiliar learning environment.

This finding might also be explained by the fact that from years of experience with a variety of courses and learning methodologies, students have learned how to be adaptive and flexible with different learning methods and environments. They may also have found that most learning situations provide enough flexibility for them to be able to work with their own style, even though it may be at a less than optimal level. Individual learning styles may also be more closely associated with how and how effectively the student works within the course but not with his selection of course methodology. This may represent a parallel with March and Simon's [9] differentiation between variables associated with motivation to participate and those associated with motivation to produce in a work organization. Nonetheless, it is clear from the results of our study that selection of course methodology is unrelated to student preferred learning style.

LEARNING STYLES AND PERCEPTIONS OF LEARNING

To test the hypotheses relating learning styles to students perceived learning, the total learning scores were broken down into quartiles and compared to learning style categories using contingency tables. As shown in TABLES 2, 3, 4, and 5, none of the X^2 tests obtained were significant, and once again we must accept the null hypotheses. This suggests that individual preferred learning styles, no matter which learning methodology is encountered, are not related to how much the student perceives he has learned.

TABLE 2
CROSSTABULATION OF LEARNING STYLE BY TOTAL LEARNING QUARTILE
ALL SECTIONS

	Learning Quartile				
	Highest 1.	2nd 2.	3rd 3.	Lowest 4.	Row Total
Learning Style					
Balanced	1 (3.7)*	0 (0)	0 (0)	0 (0)	1
Diverger	1 (3.7)	2 (6.9)	3 (9.1)	3 (10.7)	9
Assimilator	5 (18.5)	6 (20.7)	3 (9.1)	4 (14.3)	18
Converger	16 (59.3)	11 (37.9)	21 (63.6)	15 (53.6)	63
Accommodator	4 (14.8)	10 (34.5)	6 (18.2)	6 (21.4)	26
Column Total	27	29	33	28	117

Chi Square = 10.88404 with 12 df. p = .5389
*parentheses indicate column percentages

TABLE 3
CROSSTABULATION OF LEARNING STYLE BY TOTAL LEARNING QUARTILE
SIMULATION SECTION

	Learning Quartile				
	Highest 1.	2nd 2.	3rd 3.	Lowest 4.	Row Total
Learning Style					
Balanced	1 (7.7)*	0 0)	0 (0)	0 (0)	1
Diverger	0 (0)	1 (7.1)	2 (13.3)	1 (7.1)	4
Assimilator	0 (0)	4 (28.6)	3 (20.0)	2 (14.3)	9
Converger	11 (84.6)	5 (35.7)	7 (46.7)	8 (57.1)	31
Accommodator	1 (7.7)	4 (28.6)	3 (20.0)	3 (21.4)	11
Column Total	13	14	15	14	56

Chi Square = 13.39915 with 12 df. p = .3407
*parentheses indicate column percentages

TABLE 4
CROSSTABULATION OF LEARNING STYLE BY TOTAL LEARNING QUARTILE
CLASSICAL SECTION

	Learning Quartile				
	Highest 1.	2nd 2.	3rd 3.	Lowest 4.	Row Total
Learning Style					
Diverger	1 (11.1)*	0 (0)	2 (25.0)	0 (0)	3
Assimilator	3 (33.3)	3 (33.3)	0 (0)	1 (20.0)	7
Converger	3 (33.3)	2 (22.2)	5 (62.5)	4 (80.0)	14
Accommodator	2 (22.2)	4 (44.4)	1 (12.5)	0 (0)	7
Column Total	9	9	8	5	31

Chi Square = 12.65628 with 9 df. p = .1788
*parentheses indicate column percentages

TABLE 5
CROSSTABULATION OF LEARNING STYLE BY TOTAL LEARNING QUARTILE
CASE SECTION

	Learning Quartile				
	Highest 1.	2nd 2.	3rd 3.	Lowest 4.	Row Total
Learning Style					
Diverger	0 (0)*	0 (0)	0 (0)	2 (28.6)	2
Assimilator	1 (14.3)	0 (0)	1 (14.3)	0 (0)	2
Converger	3 (42.9)	6 (100.0)	4 (57.1)	3 (42.9)	16
Accommodator	3 (42.9)	0 (0)	2 (28.6)	2 (28.6)	7
Column Total	7	6	7	7	27

Chi Square = 12.26020 with 9 df. p = .1990
*parentheses indicate column percentages

Although we found these results both surprising and disappointing, they are consistent with our earlier findings and with at least much of our direct experience with individual students. This suggests that students have developed abilities either to adapt to the learning environment or to find ways within any method of learning to apply their own styles regardless of differences in pedagogy. We might also infer that any of these three learning methodologies contain enough flexibility and richness to allow for diverse learning styles to be relatively equally effective for students.

It is important, however, to underscore that these results do ~ lessen the usefulness we find in the learning cycle concept or the learning style model. We have found the learning cycle tremendously

helpful in designing and conducting not only the simulation but other courses and learning methodologies as well, especially those with an experiential base. It consistently stimulates our attention to the need to include each phase of the learning process. Furthermore, we find the learning styles model of great help to us in our efforts to enhance and enrich the learning for individual students and groups. This has been particularly true when students encounter learning difficulties, stagnancy or loss of motivation during a course. It also frequently provides a helpful framework for helping students to understand and accept the differences among themselves and to make productive use of each others' skills and propensities.

Thus, we have found that measures of preferred learning styles are not predictive of student selection of learning environments or methodologies, nor are they predictive of how much a student will learn within a given learning setting. However, we have found them very useful for students and instructors alike in helping to manage and help the learning process.

COMPARING PERCEIVED LEARNING IN SIMULATION, CLASSICAL AND CASE SECTIONS

The first hypothesis to be tested is whether the amount of perceived learning is related to the section chosen. The data in TABLE 6 indicate that the hypothesis can be accepted. In effect, we are saying that perceived, student learning is at least partly dependent upon the choice of pedagogy. Examining column frequencies in TABLE 5 reveals that 63% of the students reporting the highest learning were enrolled in the simulation while approximately 15% of the high learners were in the case section. Similarly 21.4% of the students reporting the lowest learning were in the simulation section, whereas 42.9% of the low learners were in the case section. These figures bear testimony to the hypothesized relationship.

TABLE 6
CROSSTABULATION OF LEARNING QUARTILES BY COURSE METHOD

	Learning Quartile				
	Highest	2nd	3rd	Lowest	Row Total
Simulation	17 (63.0)*	18 (62.1)	15 (45.5)	6 (21.4)	56
Classical	6 (22.2)	7 (24.1)	11 (33.3)	10 (35.7)	34
Case	4 (14.8)	4 (13.8)	7 (21.2)	12 (42.9)	27
Column Total	27	29	33	28	117

Chi Square = 14.626 with 6 df. p = .0234
*parentheses indicates column percentages

Having determined that perceived learning is significantly related to pedagogy, the next hypotheses to be considered were whether the mean learning in two section comparisons were equal. The data for these tests appear in TABLE 7. Simulation provides significantly

TABLE 7
COMPARISON BETWEEN MEANS TOTAL LEARNING SCORE

	$\bar{X}$	N	t	n	p
Simulation	81.91	56	2.712	88	<.01
Classical	72.97	34			
Simulation	81.91	56	4.565	81	<.001
Case	64.33	27			
Classical	72.97	34	1.627	59	N.S.
Case	64.33	27			

Maximum possible score: 108, minimum possible score: 18

greater total perceived learning scores than either the classical or case sections. However, there is no significant difference in the total perceived learning scores between the classical and case sections.

In summary, there is strong evidence from this research that students in the simulation report greater perceived learning than students in either the classical or case methods of teaching business policy, as defined by the course objectives. The test data also establishes that there is no significant difference between the classical and case methodologies. Although the extent of interpretation of these results is limited by the size of the sample and the potential for other factors to influence these findings, their strength and clarity are hard to overlook. Certainly, support for the efficacy of simulation games is provided.

These findings are in disagreement with some of the previous studies regarding learning from simulation environments. While the findings are somewhat mixed (see [10, p.3391; [3, p. 4]; [1, p. 383]; and [5, p. 41]) it appears as if no strong case can be made for one teaching method versus another. One possible reason for the findings presented in this study is the employment of a singular teaching method in each section. Previous studies have employed simulation games as either a supplementary activity to another method of teaching or as a complementary activity. It is our contention that the full benefits of simulation can only be fully realized when (1) a simulation is used as the total environment for a given set of learning objectives and (2) the simulation is complex rather than simple [4, p. 30].

CONCLUSIONS AND FUTURE DIRECTIONS

We have found that measures of student-preferred learning styles are not predictive of either selection of learning methodologies or of how much they will learn in a given learning environment. Although this appears to be the case, we continue to find the learning cycle and learning styles concepts particularly useful in managing and enhancing the learning process. In fact, this may account for some of the extent to which students have perceived more learning from the simulation than from the other methodologies. Our findings show that simulation produces more learning as perceived by students than did the classical or case methodologies. Although this would seem only to add fire to the long-term discussion in the literature about the relative effectiveness of simulation games and other learning methodologies, it does support the findings of Raia [10, p.139] and Fritzsche [5, p. 41]. However, it is our contention that the

simulation as used here, constituting the whole learning process, provides a learning environment that is more inclusive of the stages in the learning cycle. That is, there is more opportunity for students to engage repeatedly in each of the stages in the learning cycle. In addition, the student assumes much more of the direct responsibility for his learning. Thus it becomes a more fully experience-based learning process.

Clearly, this contention that the use of a highly complex simulation game which is used as the total learning environment and process, as opposed to the use of a simpler game as a supplement to other methods needs further exploration. At this point, we continue to believe that the more complex and rich the simulation is, the more closely it approximates the experience of actual practice. We contend further that greater learning is derived for students as the learning process becomes more fully experience-based. It is in this direction that our research is turning now.

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