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AN EXPERIMENT PROJECT TO DETERMINE THE RELATIVE TEACHING EFFECTIVENESS OF THE CASE METHOD VERSUS THE LECTURE METHOD

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1. Introduction

In early 1978, the U.P. College of Business Administration (UPCBA) conducted initial discussions with the Modellversuch, Institut fuer Wirtschafts-und Sozialwissenschaften of the Technische Universitaet Muenchen (TUM) in West Germany regarding the conduct of a joint, parallel experiment on the teaching of management at the college level. Both in the Philippines and in West Germany, management has traditionally been taught using the lecture method. In the last two decades, the so-called case method has gained a growing degree of acceptance among the management schools as an alternative management teaching technique. However, there has been little empirical study evaluating the relative teaching effectiveness of the case method alternative.

The joint experiments, conducted at the UPCBA and TUM in 1978-1979 and completed in early 1980, were intended to obtain some evidence regarding the relative efficiency of the two teaching methods in actual classroom settings. The final reports were discussed in the First International Conference on the Case Method at l'-Institut Pour l' Etude des Methodes de Direction de l' Enterprise (IMEDE) in Lausanne, Switzerland on July 5-8 1980.

This is a report of the experiment at the U.P. College of Business Administration.

2. Objective of the Study

Ultimately, teaching methods in management education should be selected to address the manpower requirements of business firms,

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public institutions, and other employers of management graduates. The overall problem in management education remains the need to minimize the training time and cost involved in "phasing in" new graduates and to ensure the linkage of university learning and the practical management needs of industry and government.

A global objective for the study was stated as follows:

> To determine which teaching method or combination of teaching methods is most efficient for the development of the knowledge, skills and attitudes necessary for the application of management principles to decision-making in practical problems.

The following were the specific objectives of the two experiment projects:

1. To determine the overall teaching effectiveness of the case method as compared to the lecture method; and
2. To determine the teaching effectiveness of the case method relative to the lecture method in the following specific areas:
   a) Development of skills and attitudes necessary for the application of knowledge;
   b) Development of skills and attitudes necessary for the analysis and solution of problems which require heuristic approaches; and
   c) Development of oral and written communication skills.

3. The Experimental Course: Marketing Management

The experimental course chosen for the experiment study, Marketing Management, is one of the specialized terminal courses taken by senior undergraduate students in their last academic year at the College of Business Administration. It is the second of two courses in the functional area of Marketing. The first course, "Introduction to Marketing Management," covers an overview of marketing institutions, marketing policies and methods and is fundamentally theory-based. This second course, Marketing Management, focuses on marketing practices. In this course, students are expected to be exposed to the following essential areas: (a) theories, processes and framework of marketing management; (b) analysis and synthesis of marketing information and communications; (c) system-

atic analysis and solution to complex problems in marketing management; and (d) preparation and effective communication of comprehensive marketing strategies and action plans.

The course was deemed most suitable for the purpose of the experiment study for the following reasons:

1) it paralleled the experimental course at the TUM in Munich since it was also a specialized course designed to develop specific skills in a particular management area (marketing);

2) it was a senior course which related directly to the needs of industry and government; and

3) the course may be taught using either the lecture method or the case method.

4. Research Design

The study as planned was intended to provide a rigorous, objective and systematic evaluation of the teaching effects of the case method versus the lecture method. The major area for evaluation was the relative learning efficiency observed in the samples. In addition, the study was intended to examine any relationship between learning and student attitude on the subject using some given instruments for attitude measurement.

The research design used by the UPCBA and the TUM was the Pretest-Posttest Control Group Design. This design was chosen because of the efficiency at controlling the problems relating to the internal and external validity of the experiment (Campbell and Stooley, 1963).

Essentially, the following were the features of this research design:

1. Two groups – a Case Method Class (Experimental) and a Lecture Method Class (Control Group) – were organized. The two classes were initially comparable as to the class level of the knowledge necessary and useful for the course ("entry knowledge").

2. The two groups were administered a pretest in Marketing Management to assess the level of marketing knowledge at the start of the course. Again the two groups were expected to be comparable on this basis.

3. During the semester, one group was taught using only the Case Method while the other was handled only by the Lecture Method.

4. The two groups were administered a posttest in Marketing Management to assess the level of knowledge at the end of the course. The significance of observed learning gains was measured and differences between the two groups assessed.

In addition to the study of teaching method effects on learning, the experiment study was also an inquiry into the possible relationship between student attitude on the subject, and his learning efficiency. A pretest to determine student attitude toward the subject at the start of the course and a posttest to measure the same at the end of the course were administered. Correlation measures between student subject scores (learning) and student attitude scores shall be prepared at the end of the semester. The attitude test instrument used was the Subject Specific Attitude Test ("Fachspezifische Einstellung") prepared and validated by Dr. Hans Specht, one of the TUM consultants for the project.

Finally, the research design selected allowed for the comparison of the two experiments – here and in Germany – by requiring the use of the generally accepted Flanders Interaction Analysis technique for the objective description of the actual teaching methods applied in the two experiments. The study submitted, using this technique, a summary of "characteristic variables" observed in the case method class and in the lecture method class. Thus not only was a comparison of results obtained possible, but also a comparison of teaching techniques actually employed.

4.1 Experiment Hypotheses Tested

As there was a defined global or overall objective for the study – evaluation of efficiency of teaching methods – the experiment had an overall hypothesis which was tested. The study groups at the UPCBA and at the TUM, therefore specified the overall experiment hypothesis as follows:

H: The use of the Case Method, a teaching method which is overwhelmingly inductive in approach results in higher effectiveness in the learning of management or applied economics as compared to the Lecture Method which is primarily deductive in approach

because the task of shifting from abstraction to concrete learning and from concrete to abstract levels necessary in these courses is better learned by inductive reasoning.

This hypothesis emphasized that the study investigated two different teaching methods as affecting student efficiency in specific learning areas for a management or applied economics course.

The main experiment hypothesis was further divided into sub-hypotheses which segregated learning areas into these two major categories: 1) Knowledge and comprehension ("reproduction of knowledge") and 2) Analysis and synthesis ("application of knowledge") (Bloom, 1956).

The following sub-hypotheses were formulated:

Sub-Hypothesis 1:

H_A: The Case Method is more effective than the Lecture Method in enabling the students to learn, recall and reproduce course materials in Marketing Management.

Sub-Hypothesis 2:

H_B: The Case Method is more effective than the Lecture Method in enabling the students to apply their knowledge to obtain problem awareness, to undertake systematic analysis and to prepare plans of action given actual phenomena and problems in Marketing Management.

Measurement of results, in a rigorously controlled study must however relate to more delineated areas. Thus, the final hypothesis which was tested was at an 'operational' level, i.e., subject to objective measurement, through pre-designed examination instruments. The experiment then adopted "third level" or operational hypotheses as follows:

Under Sub-Hypothesis 1:

1. On Knowledge H_1: The Case Method is more effective than the Lecture Method in the teaching of terminology, methodology, criteria, generalizations and structure.

2. On Comprehension H_2 : The Case Method is more effective than the Lecture Method in developing the ability to translate and interpret marketing communication.

Under Sub-Hypothesis 2:

1. On Situation Analysis:

H 3.1 : The Case Method is more effective than the Lecture Method in the development of the students' ability to analyze the elements and their relationships in problem situations.

2. On Problem Awareness:

H 3.2 : The Case Method is more effective than the Lecture Method in developing the ability to identify and explain the dimensions of a problem in management situations.

3. On Synthesis and Evaluation:

H 4.1 : The Case Method is more effective than the Lecture Method in developing the ability to define alternative solutions to marketing problems.

H 4.2 : The Case Method is more effective than the Lecture Method in developing the ability to evaluate alternative solutions to marketing problems.

4. On Decision-Making:

H 4.3 : The Case Method is more effective than the Lecture Method in the development of the ability to arrive at optimal decisions for marketing problems and to prepare corresponding action plans.

The foregoing hypotheses, set up to investigate the effects of teaching methods on cognitive learning processes, were so phrased as to claim superiority of the case method relative to the lecture method simply to sharpen the focus of the study. Clearly, a "no-difference" hypothesis could also have been formulated for each of these stated "alternative" hypotheses.

The study likewise evaluated the relationship between the teaching method employed and the attitude of students towards the subject. Similarly, an overall hypothesis was stated as follows:

H : The use of the Case Method results in a higher positive change in attitude of students towards the subject, compared to the use of the Lecture Method, and this positive change in attitude is related to the students' effectiveness in learning the subject matter.

The following were the operational hypotheses tested in the study:

1. On the Effect of Teaching Method on Attitude

H_1 : The Case Method, compared to the Lecture Method, has a significant positive effect on the attitudes of the students towards the subject matter.

2. On the Relation Between Attitude and Learning

H_2 : The positive change in attitudes towards the subject resulting from the use of the Case Method, as compared to the Lecture Method, is related to the student's level of achievement of teaching objectives for the subject.

4.2 Measurement Instruments

The measurement instruments employed to test the foregoing hypotheses were of two types: the subject-specific test and the attitude test.

The subject-specific or Marketing Management test was developed from a three-pronged approach to the objective of the study. First, since the study aimed to determine an optimal teaching method which will satisfy the demands of industry and government for

Table 1 – Scoring Matrix for Subject Specific Test

LEARNING AREAS \ LEVELS OF LEARNING AND SKILLS	I. KNOWLEDGE a) Terminology b) Categories c) Criteria d) Methodology e) Generalization f) Structures	TOTAL	II. COMPREHENSION Interpretation	TOTAL	III. ANALYSIS a) Analysis of Elements b) Analysis of Relationships c) Problem Awareness	TOTAL	IV. SYNTHESES EVALUATION a) Setting up Alternatives b) Definition of Relevant Criteria c) Analysis of Alternatives d) Decision and Preparation of Plan	TOTAL	V. COMMUNICATION
1. The Marketing Management Function	x x x x								
2. The Macro-Environment	x x		x		x x x				
3. Appraising Market Opportunities	x x				x x x				
4. Marketing Information System	x x x				x x x		x x x x		
5. Marketing Research	x				x x x		x x x x		
6. Strategic Marketing	x x								
7. Product Decisions					x x x		x x x x		
8. Distribution Decisions					x x x		x x x x		
9. Pricing Decisions					x x x		x x x x		
10. Promotion Decisions					x x x		x x x x		
11. Physical Distribution Decision					x x x		x x x x		
12. Marketing Program Administration					x x x		x x x x		
13. International Marketing	x x x x								
LEARNING LEVELS									
TOTAL SCORES									

expertise need, several skills required in the decision-making process in industry, ranging from "knowledge of concepts" to "synthesis and evaluate skills," were enumerated. Second, Bloom's taxonomy of educational objectives was reviewed in terms of its relevance to the experimental course. Third, the course objectives were evaluated and compared against the "needs of industry" and Bloom's taxonomy of educational objectives.

The result of this exercise is a matrix, shown in Table 1, which served to concretize the areas of inquiry in the experiment. The "levels of learning and skills" column encompasses the needs of industry, a taxonomy of teaching objective and the traditional course objectives. The "learning areas" column represented the topical areas for the course. From this matrix, the test items were determined, represented by 'X' marks. The hypotheses selected were clearly represented in the "level of learning and skills" section and could therefore be measured through resulting total student scores for those sections of the test. The test items were a mix of types ranging from definitions, to enumeration, to essay problems and complete decision-making situations. The scale applied in the correction of this test instrument was the usual interval scale used in this course, with point allocation determined by the expected solution time for each question.

The Subject Specific Attitude questionnaire prepared by Dr. Hans Specht of Technische Universitaet Muenchen in 1977 was a measure of the changes of attitude of students toward the subject in both the case and lecture classes for the duration of the course. This test measured any significant relationship between student attitude and learning effectiveness resulting from applications of different teaching methods under controlled conditions. The test consisted of thirty (30) questions classified into five broad attitude factors:

Factor I: Motive to Avoid Failure

Question Nos: $\overline{11}$, $\overline{12}$, $\overline{13}$, $\overline{14}$, $\overline{18}$, $\overline{19}$, $\overline{20}$, $\overline{26}$, $\overline{28}$

Factor II: Need for Approval or Affirmation by Authority

Question Nos: $\overline{6}$, $\overline{8}$, $\overline{10}$, $\overline{25}$

Factor III: Readiness to Exert Effort in Subject

Question Nos: 5, 15, 22, $\overline{24}$

Factor IV: Interest in Subject Matter

Question Nos. 1, 2, 3, $\overline{9}$, 16, 17, 30

Factor V: No Classification

Question Nos: $\overline{4}$, 7, $\overline{21}$, $\overline{23}$, 27, 29

Factor V consisted of items not belonging to any specific factor.

For use in the study at the College of Business Administration, the Subject-Specific Attitude Test was adapted for the Marketing Management course. Preliminary to revision of the questionnaire, 15 randomly selected faculty members of the College were asked to examine the direct translations of the subject-specific attitude test and determine whether the statements were meaningful within the context of the Marketing Management course. This served as a simple cross-cultural validity check of the translated questionnaire in terms of its applicability and use in the Philippine setting. The questionnaire is presented in Appendix A.

Majority of the faculty respondents suggested the rephrasing of some of the statements in order to increase their understandability, meaningfulness and relevance with respect to the Marketing Management course. The statements were then reworded in an effort to retain "translation equivalence" (i.e., retain the meaning of the original Specht's Subject-Specific Attitude Test). The sequence of the statements was also revised in such a way that no two statements from the same factor group succeeded each other, so as to prevent "sequence effects" (i.e., the student's tendency to respond in the same way simply because succeeding statements seemed to belong to the same category). The sequence revision involved changes in the numbering of questions in the test questionnaire form as shown in Table 2.

The final form of the revised Subject-Specific Attitude Test as actually applied at the College, therefore, consisted of the following factor group question sets:

Factor I: Motive to Avoid Failure

Question Nos. $\overline{1}$. $\overline{5}$, $\overline{9}$, $\overline{13}$, $\overline{16}$, $\overline{21}$, $\overline{23}$, $\overline{28}$, $\overline{30}$

Table 2 – Revision of the Attitude Test

Specht's Original Questionnaire	U.P.'s Revised Form	Specht's Original Questionnaire	U.P.'s Revised Form	Specht's Original Questionnaire	
1	7	$\overline{11}$	$\overline{1}$	$\overline{21}$	$\overline{11}$
2	10	$\overline{12}$	$\overline{9}$	22	24
3	15	$\overline{13}$	$\overline{5}$	$\overline{23}$	$\overline{17}$
$\overline{4}$	$\overline{3}$	$\overline{14}$	$\overline{13}$	$\overline{24}$	$\overline{29}$
5	4	15	12	$\overline{25}$	$\overline{20}$
$\overline{6}$	$\overline{2}$	16	22	$\overline{26}$	$\overline{30}$
7	6	17	26	27	19
$\overline{8}$	$\overline{8}$	$\overline{18}$	$\overline{16}$	$\overline{28}$	$\overline{28}$
$\overline{9}$	$\overline{18}$	$\overline{19}$	$\overline{23}$	29	25
$\overline{10}$	$\overline{14}$	$\overline{20}$	$\overline{21}$	30	27

Factor II: Need for Approval or Affirmation by Authority

Questions Nos.: $\overline{2}$, $\overline{8}$, $\overline{14}$, $\overline{20}$

Factor III: Readiness to Exert Effort in Subject

Questions Nos.: 4, 12, 24, 29

Factor IV: Interest in the Subject Matter

Questions Nos.: 7, 10, 15, $\overline{18}$, 22, 26, 27

Subsequent interpretations of results were based on guidelines provided by Dr. Hans Specht on score scales, and statistical tests of significance.

5. The Experiment Study

The initial step in the implementation of the research, i.e., setting up two statistically comparable groups, was completed within the first week of classes. All students who intended to enroll in the Marketing Management courses offered during the semester were required to take the Entry Knowledge Test, a test designed to assess their preparation for the course. Later, students were ranked as to their scores in this test and this student performance factor was the basis for random assignment of students to the Case Method Section or to the Lecture Method Section. Although ideally, match pairings and random assignments of pairs to experimental or control sections assure an unbiased sample, this was not deemed administratively feasible since the College enrollment was on a preregistration basis. However, some transfers of students from one section to another based on the pre-examination results were made to ensure parallelization. Moreover, it was felt that the issue of randomization of assignments to groups was partly answered by the random, first-come-first-served, basis of student preregistration in the two courses.

Two sections in Marketing Management were opened for the same slots, scheduled on two different week-day schedules. One teacher was assigned to handle both classes using identical course outlines and basic reference and reading materials. Once the two classes had been set up, the only differences between the two sections were meeting dates, students' assignments (cases or readings) and the teacher's role in the classroom (lecture or case discussion coordination).

Both classes used as textbook Philip Kotler's *Marketing Management: Analysis, Planning and Control* (Prentice-Hall, 4th Edition 1980). The Lecture Method students were assigned specific chapters from the text in preparation for each lecture session while in the Case Method, students were assigned the same assignments.

In order to control actual classroom teaching activities along the lecture or case method only, a teacher's manual was prepared for the two study groups. This manual served as the teacher's guide in the handling of the two classes, with essential differences noted in three aspects: assignment to students, teacher preparation and classroom management. The highlights are summarized in Table 3

Teacher Activity	Case Method Section	Lecture Method Section
1. Assignments to Students	a. Topics or subject matter for forthcoming sessions	a. Topics or subject matter for forthcoming sessions
	b. Cases	b. Appropriate readings
2. Teacher Preparation	a. Outline of case's teaching objectives, approaches and schemes for analysis	a. Lecture outline and draft
	b. Discussion outline for technical notes in relation to cases	b. Visual aids
3. Classroom Management	a. For some cases, the teacher serves as a discussion leader, stimulating discussion of the case throughout.	a. Develop the teaching objective for each session at a conceptual level.
	b. For other cases, assigned groups undertake full case analysis.	b. Present examples and illustrations of concepts in Marketing Management.

5.1 Class Profiles

The two classes constituted in the above described fashi were compared in terms of their Entry Knowledge Test scores shown in Table 4.

TABLE 4 – Entry Knowledge Median Scores

Class		Median
Case Method		51
Lecture Method		48
Z value*	.37	

*Mann Whitney U-test; Not significantly different at $\alpha = .20$

Other profile data on the two classes are summarized in Table

TABLE 5 – Student Profiles

Characteristics	Class Means Case Class (N = 37)	Lecture Cl (N = 41)
Grade Point Average Prior to Entry to College of Business	2.03	1.96
Grade Point Average for all Courses at the College of Business	2.07	1.96
Cumulative University Credits	95.81	94.58
Degree Major		
Business Administration	26	17
Accounting	8	16
Others: Economics, Agribusiness, etc.	3	8
Sex		
Male	11	11
Female	26	30
Years in College		
Junior	3	1
Senior	32	35
Unclassified	2	5

5.3 *Tests on the Adequacy of Parallelization*

As a further check on the adequacy of the parallelization of the two classes, student test scores on the Marketing Management pretest and on the Specht Attitude pretest were compared. Table 6 shows a comparison of the two groups on the Marketing pretest.

TABLE 6 – Pretest Scores and Significance[a]

	MEDIAN SCORES FOR TEST SECTIONS							
GROUP	H_1	H_2	H_3	H_4	H_5	H_6	H_7	TOTAL
1. Case	12	4	16.1	11.3	5	2	6	53.75
2. Lecture	11	4	17.1	11.1	5	2	5	57.70
Z – Value*	39	.07	.80	.21	.39	.19	.15	.25

H's refer to specific hypotheses tested.

[a]Mann-Whitney U-test

*All results not significant at $\alpha = .2$

Table 7 shows the results on the Specht attitude pretest.

TABLE 7 – Attitude Pretest Scores

CASE METHOD VERSUS LECTURE METHOD

Attitude Factor	MEAN SCORES Case Class	Lecture Class	t Value[a]	P Level
A Motive to Avoid Failure	2.50	2.57	.58	.3 <P <.4
B Need for Approval of Authority Figure	2.24	2.30	.49	.3 <P <.4
C Readiness to Exert Effort	2.28	2.41	1.14	.1 <P <.2
D Interest in Subject Matter	4.19	4.22	.75	.2 <P <.3
E Unclassified	3.12	3.12	1.4	.05 <P <.1
Overall Attitude Score	2.27	2.82	1.15	.10 <P <.2

[a]t – test, df = 54

Since the results on both the above tests showed nonsignificant differences, the two classes were considered statistically equivalent and the assignment of students to the two classes made final.

6. Flanders Interaction Analysis

One portion of the study used the Flanders Interaction Analysis System (FIAS),Appendix B, to find out whether student involvement in the class taught by the case method differed significantly from that in the class taught by the lecture method. FIAS compared teacher involvement in the interaction in both classes to provide evidence of differentiation in teacher input in using the two methods.

The comparison of the two classes was based on the follow measures from the FIAS:

1. Proportions of teacher-talk
2. Proportions of student-talk
3. Proportions of silence
4. I/D Ratios
5. Proportions of questioning, lecturing, accepting/using students' ideas
6. Proportions of student response and student initiation.

The study also sought to find out trends or patterns of chan if any, in three observations spread over a 16-week course. Speci ally, it aimed to answer the question: How do student and teac involvements in the learning situation change as the course pr resses?

6.1 Procedure

The two classes were each observed three times – early in semester, midway, and towards the end of the semester. The obse ations were spaced approximately six weeks apart.

An earlier observation which served as a dry run introduced observer to the students in both classes. Data from that observati were not included in the analysis.

In each of the three observations, verbal interaction was not on-the-spot by the observer even as the session was recorded on ta A reliability check was done by analyzing the tape-recorded int action independently.

Proportions of student-talk, teacher-talk and silence were co puted. Similarly, proportions of categories under teacher- a student-talk were noted. I/D ratios were compared.

The accomplished interaction matrices from the three o servations of each class are shown in Appendix C.

6.2 *Results and Findings*

A. Teacher-Talk

In the three observation times, the proportion of teacher-talk was consistently much higher in the lecture class than in the case method class (Table 8). In the lecture class, lecture took up about three-fourths to four-fifths of the verbal interaction while in the case class, teacher-talk accounted for at most three-fifths of the verbal interchange. Compared to the "rule of two-thirds" noted in previously cited studies, it can be said that the lecture and case methods show respectively higher and lower proportions of teacher-talk. Between the two methods under study, a significant difference in proportions of teacher-talk was observed.

Table 8 also shows that the proportion of teacher-talk in the lecture class increased steadily over the three observation times, while in the case method class, no distinct trend can be noted.

TABLE 8 – Proportions of Teacher- and Student-Talk in the Two Classes in Three Observations

Observation	Lecture Method				Case Method			Total
	TT*	ST*	S	Total	TT	ST	S	
First	76	20	4	100	64	31	5	100
Second	79	14	7	100	53	39	8	100
Third	86	13	1	100	61	31	8	100

*TT – Teacher-Talk

ST* – Student-Talk

S – Silence

B. Student-Talk

Student participation in the verbal interchange was about *twice as much in the case class as in the lecture class.* The difference between corresponding proportions of student talk in the two classes was highest during the second observation. It

was slightly lower in the third observation, but still higher than in the initial observation.

A larger proportion (8%) of silence was noted in the case class than in the lecture class (1%) in the third observation. The other two observations showed about equal proportions of silence.

C. Nature of Student-Talk

Student-talk can either be a response or an initiation. The ratio of either category to the total student-talk observed indicated the nature of student participation in the verbal interaction.

Table 9 shows that in the lecture group, student-talk response is greater than student-talk initiation. The reverse is true in the case method group in two of the three observations. The proportions of student talk response in the lecture group are consistently higher than those in the case method group. This means that in the case method, the students' talk tended more to *initiate* ideas rather than to respond to the teachers' questions. In either group, the highest proportion of student-talk initiation occurred in the second observation.

TABLE 9 – Proportions of Student Response and Student Initiation in the Two Classes in Three Observations

Observation	Lecture Method			Case Method		
	Response	Initiation	Total	Response	Initiation	Total
First	53	47	100	42	58	100
Second	79	21	100	56	44	100
Third	55	45	100	45	55	100

D. Nature of Teacher-Talk

Teacher-talk consisted of asking questions, giving straightforward lectures, accepting or using students' ideas, giving commands, criticizing or praising students. No instance of criticizing students was noted in any of the six matrices in Appen-

dix C. Only instances of giving commands were noted, both of them in the first observation of the case method group.

From Table 10, it can be noted that questions took up larger proportions of the teacher-talk in the three observations of the case group than in the lecture group. On the other hand, teacher lecture was significantly more often resorted to in the lecture group. There was consistently more accepting and using of students' ideas in the case method in all the three observations.

It can be inferred that interaction was significantly more of "give and take" in the case group while in the lecture group, it intended to be "one way," that is, teacher-dominated.

TABLE 10 – Proportions of Teacher Question, Lecture and Accepting/Using Ideas in the Two Classes in Three Observations

Class	Observation	Question	Teacher Talk		Others	Total
			Lecture	Accepting/ Using Students' Ideas		
Lecture	First	16	76	6	2	100
	Second	22	73	5	0	100
	Third	10	84	5	1	100
Case	First	25	60	12	3	100
	Second	40	37	23	0	100
	Third	40	34	18	8	100

E. Indirect Vs. Direct Teacher Influence

Categories 1 to 4 in the Flanders Interaction Analysis System manifest indirect teacher influence while categories 5 to 7 indicate direct teacher influence. Since few entries were noted for Categories 6 and 7 (See Appendix C), the I/D ratio in the teaching observed is mainly a function of Category 5, which is "lecturing."

In both groups, direct teacher influence was evident in the first observation (Table 11). However, in the second and third observations of the case group, indirect teacher influence was greater than direct teacher influence, whereas in the lecture group the initially observed comparison between direct and indirect influence was maintained in the second and third observations. The I/D ratios from the case group were all consistently much higher than those from the lecture group. This suggests that the case method teacher consistently supported and motivated students. This is very evident in the high frequencies of entries in categories 2, 3 and 4 of the matrices from the case group compared to those from the lecture group (Appendix C).

The I/D ratio gives an indication of how many times more indirect than direct is the teacher's verbal interaction with the students in the classroom. From Table 11, it is quite evident that for the lecture group the ratios were decreasing while those for the case group increased from .64 to 1.46 in the second observation, and then to 1.27 in the third.

TABLE 11 – Proportions of Indirect and Direct Teacher Influence and I/D Ratios in the Two Classes in Three Observations

Class	Observation	Influence		I/D Ratios
		Indirect (I)	Direct (D)	
Lecture	First	24	76	.32
	Second	27	73	.37
	Third	16	84	.19
Case	First	39	61	.64
	Second	62	38	1.46
	Third	56	44	1.27

6.3 Conclusions

A. Summary of Findings

The observations yielded these findings:

1) In both classes, the teacher dominated the interaction, which is normal.

2) In all the three observations, there was more teacher-talk in the lecture class than in the case class. The difference between the proportions of teacher-talk in the two classes increased as the course progressed.

3) Lecturing and asking questions were the predominant teacher-talk in both classes. More questions were asked in the case class, while more lecture was evident in the lecture class.

4) Student-talk was more frequent in the case class than in the lecture class. In the latter, the proportions of student-talk decreased as the course progressed. This was a concommitant result of the increasing proportions of teacher-talk over the three observations. In the case class, the initial and final observations showed equal proportions of student-talk; the proportion was slightly higher in the second observation.

5) The proportions of silence or confusion in the two classes differed only in the third observation. More pauses and silence could mean that students in the case class stopped to ponder over, or were confused by, ideas more than those in the lecture class.

6) There was significantly more accepting and using of students' ideas in the case class than in the lecture class. In the former, the I/D ratios were consistently and significantly higher than those in the lecture class.

B. Conclusions

On the basis of the findings, these conclusions were drawn:

1) The case method effected more and better student involvement or participation in the learning situation than the lecture method.

2) The case method resulted in more student-initiated talk, hence, bringing about a two-way exchange of ideas in the classroom. Students sounded out their ideas more in a case class than in a lecture class.

3) The lecture method entailed a consistently high proportion of teacher-talk throughout the course, with a tendency toward decreasing student-talk.

C. Limitations

No attempt was made to compare the students' questions raised in the two classes. It is possible that with the increased proportion of student-talk as the course progressed, there might be changes in the nature, and sophistication level of the questions or in the style of questioning, effects of which could be indirectly attributed to the teaching method. However, such an analysis, although possible from the taped interactions, was beyond the scope of the study.

7. Posttest Results

At the end of the first semester, both classes in the experiment were administered the same Marketing Management and Attitude Tests which were given at the start of the semester. Of the 78 students who initially comprised both classes, only 74 remained at the end of the semester. Four students, all from the lecture class had dropped the course. Moreover, of the remaining 74 students, six did not appear for the final examination. Five of these were from the lecture class and one from the case class. Only 68 posttest scores were thus obtained in the experiment.

7.1 Scoring the Tests

The Marketing Management posttest was scored by the teacher handling both courses. The student papers were coded to minimize grader bias. The attitude posttest was scored according to the Specht Test Manual.

7.2 Entry Knowledge and Course Performance

To validate the use of Entry Knowledge as a basis for assigning students to the classes in the experiment, the re-

lationship between Entry Knowledge scores and Marketing Management scores was tested. The results are shown in Table 12 below:

TABLE 12 – Relationship Between Entry Knowledge and Course Performance

CASE AND LECTURE CLASSES

Class	r_s^1
Case	.388*
Lecture	.662*

Case N = 28 Lecture N = 28

[1] Spearman Rank Correlation

*P < .05

These results indicate that in both classes, the ranking of students on the basis of Entry Knowledge was essentially the same as their ranking on the Marketing Management posttest. These results may be further interpreted to mean that the Entry Knowledge Test may be used as a predictor of achievement in the Marketing posttest.

A comparison of the correlation coefficients (Fisher's Test of differences between two correlations) from the two classes showed that the difference was not statistically significant.

8. Learning Gains in the Case and the Lecture Classes

As another preliminary test on the Marketing posttest data, learning gains in each of the two classes were tested by comparing student performance on the pretest with posttest performance. Necessarily, only the scores of students who took both the pretest and the posttest were included in the sample data. The results are shown in Table 13.

As can be seen, significant learning gains in most of the test areas were made in both the case and the lecture classes. Only in H_2 (Comprehension) were gains not highly significant although the composite scores (H_A, H_B, and H_T)are highly significant.

8.1 Comparative Performance in the Marketing Management Posttest

Because the requirement of a matching set of pretest and posttest scores (as in the previous test) did not apply in this test, the test scores of all 68 students who took the Marketing Management posttest comprise the data in this test. The results are shown in Table 14.

Taken as a whole, the said results indicate that the performances of both classes were more or less equal. In the two test areas (H_3 and H_5) where differences approached statistical significance, the differences were in opposite directions. Thus, the case class was superior in H_3, but the lecture class was superior in H_5. These results failed to sustain the central hypothesis of the study, i.e., that the case method produces significantly higher learning in the course.

8.2 The Relationship Between Attitude and Learning

A second major hypothesis in the study concerns the effect of student attitudes relative to a number of factors in the learning environment on the extent of learning in the course. The hypothesis to be tested was that the more positive were the students' attitudes towards the course, the higher will be the learnings in the course. To test this hypothesis, pretest and posttest scores on the Specht Attitude questionnaire were related to performance in the Marketing Management posttest.

TABLE 13 – Learning Gains in Marketing Management (Pretest Versus Posttest)

CASE AND LECTURE CLASSES

Hypothesis Sections	Mean Pre-test score	Mean Post-test Score	T-Value[a]	Z-Value[b]
H_1(Knowledge)				
Case	13.7	57.1	0	4.45
Lecture	12.6	57.4	0	4.45
H_2(Comprehension)				
Case	3.2	4.2	88.5	1.33
Lecture	3.5	4.3	77.5	.94

Table 13 (Continued)

Hypothesis Sections	Mean Pre-test score	Mean Post-test Score	T-Value[a]	Z-Value[b]
H_3 (Analysis of Elements and Relationships)				
Case	17.3	23.7	15	4.07
Lecture	18.3	21.8	49	3.2
H_4 (Problem Awareness)				
Case	10.8	13.5	58	2.98
Lecture	11.7	13.7	72	2.62
H_5 (Setting Alternatives)				
Case	5.0	7.8	52.5	3.12
Lecture	5.1	8.2	0	4.45
H_6 (Evaluating Alternatives)				
Case	2.0	8.0	0	4.45
Lecture	2.0	8.4	0	4.45
H_7 (Decision and Implementation)				
Case	5.6	8.2	50	4.28
Lecture	6.0	8.6	62	2.88
H_A ($H_1 + H_2$)				
Case	17.4	61.3	0	4.45
Lecture	16.1	61.7	0	4.45
H_B ($H_3 + H_4 + H_5 + H_6 + H_7$)				
Case	40.4	61.6	2	4.45
Lecture	42.8	61.2	0	4.45
H_T ($H_A + H_B$)				
Case	58.1	122.9	0	4.45
Lecture	58.8	122.8	0	4.45

[a] Wilcoxon matched-pairs sign test

[b] All values, except those in H_2, are significant at $\alpha = .01$

Case N = 28; Lecture N = 28

TABLE 14 – Marketing Management Posttest

CASE METHOD VERSUS LECTURE METHOD

	Hypothesis	MEAN RANK SCORE Case	Lecture	Z-Value[a]	P
H_1	Knowledge of Terminology	35.44	33.43	0.42	.33
H_2	Comprehension	33.36	35.76	–0.56	.30
H_3	Analysis of Elements and Relationships	36.90	31.75	1.06	.14*
H_4	Problem Awareness	34.50	34.50	0.00	.50
H_5	Setting Alternatives	31.40	37.98	–1.37	.08*
H_6	Evaluation Alternatives	33.79	35.29	–0.31	.37
H_7	Decision and Implementation Plan	34.16	34.87	–0.15	.44
H_A	Knowledge and Comprehension ($H_1 + H_2$)	35.55	33.28	0.47	.32
H_B	Analysis and Decision-Making ($H_3 + H_4 + H_5 + H_6 + H_7$)	33.34	35.79	–0.51	.30
H_T	Total Score ($H_A + H_B$)	32.81	36.40	–0.75	.22

[a] Mann Whitney U-Test

*.05 < P < .20 (Tendency for statistical significance)

TABLE 15 – Relationship Between Attitude Levels and Learning

CASE AND LECTURE CLASSES

Variables Paired	r_s^1	
	Case	Lecture
Attitude Pretest/Marketing Posttest	.355*	.093
Attitude Change/Marketing Posttest	.174	.340*
Attitude Posttest/Marketing Posttest	.262	.348*

Case N = 28 Lecture N = 28

[1] Spearman Rank Correlation

*P < .05

The above results show positive correlations between attitude factors and course performance. Of the three sets of attitude variable paired with the Marketing Management score, the attitude posttest seems to be the better predictor of course performance in the two classes.

9. Attitude Changes and Teaching Methods

A third major hypothesis in the study concerns the relationship between teaching method and students' course attitudes. The hypothesis tested was that the case method produces greater positive changes in course-related student attitudes as compared to the lecture method. This was done by:

1. comparing pre- and posttest attitude scores in each class, and
2. comparing posttest attitude scores in the two classes.

The first comparison is shown in Table 16.

TABLE 16 – Changes in Attitude Levels

CASE CLASS AND LECTURE CLASS

Attitude Factor	Explanation	CASE CLASS Mean Score (Pre)	CASE CLASS Mean Score (Post)	t[a]	P Level	LECTURE CLASS Mean Score (Pre)	LECTURE CLASS Mean Score (Post)	t[a]	P Level
Factor A	Motive to Avoid Failure	2.5	2.37	−1.93	P < .05	2.57	2.58	.24	(NS)
Factor B	Need for Approval of Authority Figure	4.19	4.11	−.59	(NS)	4.22	3.99	−2.34	P<.02
Factor C	Readiness to Exert Effort in the Subject	2.38	2.28	−1.22	(NS)	2.44	2.43	−.07	(NS)
Factor D	Interest in Subject Matter	2.24	2.05	−3.02	P < .01	2.3	2.25	−.49	(NS)
Factor E	(Unclassified)	3.12	2.98	−.39	(NS)	3.12	2.97	−1.56	(NS)
Total Score		2.72	2.65	−1.74	P < .05	2.81	2.75	−1.51	(NS)

[a] t-test, df = 27

Positive changes in nearly all attitude factors were shown in both the Case and Lecture classes[3]. In the Lecture Class, attitude scores improved in Factors B, C, D, E and in the total attitude score. For the Case Class, all factor scores improved. The changes in the case class were more statistically significant than those in the Lecture Class.

The differential effects of the two teaching methods on attitudes are more directly compared in Table 17. As the table shows, the attitude scores in the Case Class were significantly better than the Lecture Class in three (A, C and D) of the five factors. The overall attitude score in the Case Class was also more favorable than in the Lecture Class. In none of the 6 attitude factors was the score of the Lecture Class significantly better than those of the Case Class. With respect to the attitude variable therefore, the experimental hypothesis that the case method is superior to the lecture method appeared to be supported by these results.

TABLE 17 – Attitude Posttest Scores
CASE CLASS VERSUS LECTURE CLASS

Attitude Factor	Explanation	Case Class	Lecture Class	t[a]	P Level
A	Motive to Avoid Failure	2.37	2.58	1.74	P < .05
B	Need for Approval of Authority Figure	4.11	3.99	– .67	(NS)
C	Readiness to Exert Effort	2.28	2.43	1.82	P < .05
D	Interest in Subject Matter	2.05	2.25	1.98	P < .05
E	(Unclassified)	2.98	2.97	.37	(NS)
Total Score		2.65	2.75	1.43	(NS)

[a] t–test; df = 54
NS – Not Significant (P > .05)

[3] In the Specht test scale, the lower the value of the attitude score, the more "favorable" is the attitude level.

10. Summary of Findings

The following observations can be made regarding the precedi results:

1. In both the Case and the Lecture Classes, student perfor ance in Marketing Management posttest was significantl better than in the pretest.

2. In both the Case and Lecture Classes, student performanc in the Entry Knowledge test was highly correlated wit their performance in the course.

3. In observed classroom interaction, the Case Class con sistently showed higher proportion of student-talk relativ to the Lecture Class.

4. Student performance in the subject-specific test did no differ significantly between the Case and the Lectur Classes.

5. In both the Case and the Lecture Classes, the correlatio coefficients between attitude scores and subject-specifi test scores were positive. These were, however, statistically significant only with respect to the Attitude Pretest Scor in the Case Class, and in Attitude Change and Attitud Posttest Scores in the Lecture Class.

6. In the Case Class, student attitudes with respect to Avoidance of Failure, Readiness to Exert Effort in th Course, and Interest in the Subject Matter were signifi cantly better at the end of the course than in the Lectur Class.

11. Concluding Remarks

The results of the experiment generally suggest that the Cas and the Lecture Methods are roughly equivalent in terms of thei effectiveness in teaching Marketing Management courses. Althoug differences were observed between the Case and the Lecture classes, viz.: (a) the Case Method Class was associated with significantly mor favorable attitudes toward the course at the end of the semester and (b) the Case Method classes were characterized by more student-talk and more student-initiated classroom interactions than the Lecture

classes, these differences were not reflected in significantly better learning performance in the Case classes relative to the Lecture classes.

While these results are reassuring in the sense that both methods were shown to be effective since significant learning gains were achieved under both methods, there are some aspects of the experiment which should be looked into more closely for purposes of relating it to the experiment at the Technische Universitaet Muenchen and for suggesting improvements in future research designs involving the Case Method.

One aspect of the experiment which merits review is the type of learning measured in the study. In the subject-specific test, the questions posed relative to each of the short cases used in the test were fairly general in character. This raises the question whether the test really measured the student's ability to make a well-reasoned decision about a marketing situation or whether the test simply measured the student's ability to relate concepts learned in the Marketing course to the case material described in the test. The overriding objective of the Case Method may be to train students in analysis *for* decision-making, i.e., for taking specific real-life actions. An alternative which may therefore be considered in future research is a test involving one or two fairly realistic Marketing cases, where the *quality* of a student's decision on the problem, (e.g., the payoff or results) will be evaluated and used as the measure of learning.

The other aspect of the experiment which needs some discussion has to do with the fact that the experiment attempted to measure differences in learning attributable to a difference in teaching method as experienced by students *in one course* over a *one semester period.* Some advocates of the Case Method emphasize that its benefits are best realized only after a fairly extended and intensive exposure to the method. Thus, future research should consider experiments which attempt to measure the comparative effectiveness of the Case Method as experienced over a longer time period.

APPENDIX A

Specht Attitude Questionnaire

We hope to enable you to express your attitudes towards Marketing Management through your answers to the following questionnaire. Your personal statements will be held confidential and will not in any way affect your grade or evaluation of your performance. You can agree or disagree with the statements using the following coefficients:

+ 2	full agreement
+ 1	partial agreement
0	neither agreeing nor disagreeing
– 1	partial disagreement
– 2	full disagreement

Please print your student number.

Student ID No. . . . . .

Please complete the questionnaire without interruption.

1) I am not very good in Marketing Management.

2) While resolving issues in Marketing Management, I would like to get immediate feedback as to whether I am going in the right direction.

3) I will really try to study Marketing Management principles only when I encounter an interesting problem in this subject.

4) I like to work on mental exercises such as crossword puzzles, mathematical riddles and the like.

5) After completing a test in my Marketing Management course, I am sure that my solution is correct only when confirmed by the instructor.

6) After completing any task, I am usually secure that my approach is correct.

7) I like lessons in Marketing Management.

8) After completing any task, it is important for me to be told whether my approach is correct or not.

9) I entirely lose interest in Marketing Management if I am blamed for my failures by the instructor, my parents or friends.

10) I like solving problems in Marketing Management.

11) To learn Marketing Management, I take notes during lectures. I use books and readings only when preparing for examinations.

12) I exert special effort when faced with a problem or issue in Marketing Management.

13) My interest in Marketing Management depends mainly on the instructor's abilities, personality and teaching techniques.

14) I exert more effort in Marketing Management when my grades in the subject are getting better.

15) Knowledge and abilities in Marketing Management are very important for the realization of my professional plans.

16) If I encounter a new problem or issue in Management, I do not care whether I solve it or not.

17) I exert special effort whenever I get praised for success in Marketing Management by the instructor or by classmates and friends.

18) Knowledge of concepts and techniques in Marketing Management is especially important in solving problems on the subject.

19) I consider Marketing Management easier than other subjects.

20) When faced with a problem in Marketing Management I try to get help from somebody who knows more about Marketing Management than I do.

21) Principles in Marketing Management have the disadvantage of being so abstract as to have almost no practical use.

22) I am interested in Marketing Management because it is a useful conceptual tool for many areas of application.

23) When faced with a task in Marketing Management I first try to find a way to avoid it.

24) I get especially irritated with having to solve as exercise a task or problem which I consider very difficult.

25) I study and learn Marketing Management because it is my area of interest.

26) I am interested in Marketing Management as a subject in Business Administration.

27) One's knowledge of concepts in Marketing Management is applicable to many situations in life.

28) I don't like to solve problems in Marketing Management at all.

29) I don't attempt to solve for exercise tasks, problems or issues which I consider difficult.

30) My interest in Marketing Management depends mainly on my grades.

APPENDIX B

FLANDERS' INTERACTION ANALYSIS SYSTEM

INDIRECT INFLUENCE	1)	ACCEPTING FEELINGS: accepts and clarifies the tone of feeling of the students in an unthreatening manner. Feelings may be positive or negative. Predicting or recalling feelings is included.
	2)	PRAISES OR ENCOURAGES: praises or encourages student action or behavior. Jokes that release tension, but not at the expense of another individual, nodding head or saying "um hm?" or "go on" are included.
	3)	ACCEPTS OR USES IDEAS OF STUDENT: clarifying, building, or developing ideas suggested by a student.
	4)	ASKS QUESTIONS: asking a question about content or procedure with the intent that a student answer.
DIRECT INFLUENCE	5)	LECTURING: giving facts or opinions about content or procedure; expressing his own ideas, asking rhetorical questions.
	6)	GIVING DIRECTIONS: directions, commands, or orders which students are expected to comply with.
	7)	CRITICIZING OR JUSTIFYING AUTHORITY: statements intended to change student behavior from unacceptable to acceptable pattern; bawling someone out; stating why the teacher is doing what he is doing; extreme self-reference.
STUDENT TALK	8)	STUDENT-TALK RESPONSE: talk by students in response to teacher. Teacher initiates the contact or solicits student statement.
	9)	STUDENT-TALK INITIATION: talk initiated by students.
SILENCE	10)	SILENCE OR CONFUSION: pauses, short periods of silence and periods of confusion in which communication cannot be understood by the observer.

APPENDIX C. 1

Indices According to Flanders for the Description of the First Experiment Matrices

	Case B-1	Lecture B-2	Case B-3	Lecture B-4	Case B-5	Lecture B-6
1. Per Cent Teacher-Talk	64.2	75.7	52.5	78.8	61	85.9
2. Per Cent Student-Talk	30.5	19.8	39.1	13.8	30.9	12.7
3. Per Cent Silence or Confusion	5.3	4.5	8.4	7.4	8.1	1.4
4. Teacher Response Ratio						
5. Teacher Question Ratio						
6. Teacher Immediate Response Reaction						
7. Teacher Immediate Question Ratio						
8. Student Initiation Ratio	58	47	43.8	20.9	55.1	45.4
9. Content Emphasis	48.2	63.6	25.9	59.7	26.8	79.2
10. Total Sustained Discourse	55.6	62.7	45.7	56.1	42.8	76.4
11. Student Sustained Discourse	67	56.8	53.2	29.8	47.8	45.4
12. Indirect-Direct Ratio	.64	.32	1.67	.37	1.41	.19
13. Indirect-Direct Ratio (Revised)	30	33	60	20	62	17

APPENDIX C. 2

Indices According to Flanders for the Description of the Second Experiment Matrices

	Case A-1	Lecture A-2	Case A-3	Lecture A-4	Case A-5	Lecture A-6
1. Per Cent Teacher-Talk	47.6	76.9	36	90.3	48.6	88.2
2. Per Cent Student-Talk	51.1	18.4	58.1	3.4	49.5	8.5
3. Per Cent Silence or Confusion	1.3	4.7	5.9	6.3	1.8	3.3
4. Teacher Response Ratio						
5. Teacher Question Ratio						
6. Teacher Immediate Response Reaction						
7. Teacher Immediate Question Ratio						
8. Student Initiation Ratio	96	34.4	84.4	30.8	81.5	35.5
9. Content Emphasis	88.7	66.3	55	85.5	68	89.2
10. Total Sustained Discourse	89.2	.2	70.7	83.5	75.9	87.9
11. Student Sustained Discourse	91.5	63.3	81.6	23.1	84.1	67.7
12. Indirect-Direct Ratio	.03	.29	.37	.09	.22	.08
13. Indirect-Direct Ratio (Revised)	1	32	9	5	15	24

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