

**Mixing Case Method with Business Games: The Student Evaluation of Teaching
Methods in Business Policy Courses**

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Abstract

This paper explores students' perceived learning from using either a complex business game or a simple one, along with some case studies in business policy courses. The pedagogical differences between the case method and the game method are discussed. The criteria important to teaching business policies are identified. The course pedagogy involves a mix of cases, computerized business games, readings, lectures, and student presentations, with the principal emphasis on cases and games. This experiment was designed to compare the perceived effectiveness of applying a simple versus a complex game as supplements to the case method in a business policy course. One hundred and fifty-nine students in a business policy course participated in the study. The results seem to indicate that the complex game is pedagogically more effective than the simple game; that the students using the complex game gain more insights into business environment and various functions of the firm; and that the complex game is as effective as the case method along some important pedagogical dimensions.

KEYWORDS: business games; case method; game complexity; participant perceptions; pedagogical effectiveness; pedagogy; perceived learning; student evaluation.

Introduction

The first business game played on a computer was introduced to managers by the American Management Association back in the mid-fifties [Bellman et al., 1957; Marting, 1957; Ricciardi, 1957; Graham & Gray, 1969, pp. 176-178]. Within the same year, the University of Washington began to use a business game, called TOP MAN [Schrieber, 1958; Meier et al., 1969, pp.

190-196]. TOP MAN, designed by Professor Albert Schrieber, is a complicated computer game with increasing levels of difficulty. In its most current version, TOP EXEC, the game has 11 levels of difficulty that include playing the New York stock market and bidding on government contracts. TOP EXEC, probably the most complicated computerized business game, is being used by a number of companies including Boeing and Rolls Royce. Such a complex game is useful in exposing executives to realistic situations that they may face in their assignments. Learning is afforded without cost to either the executives or the businesses. Such exercises are especially helpful in long-range planning situations where the simulation offers immediate feedback to the executive.

In general, games vary along six major dimensions: 1) the complexity, 2) whether they simulate a competitive market situation, 3) whether individuals or teams can play, 4) whether they deal with several industries or focus on one particular industry, 5) whether they focus on a particular set of functions, and 6) the extent to which human behavioral considerations are built into play. According to Faria and Schumacher (1984), there are well over a thousand simulation games available for instructional purposes, fitting just about every classroom need. These games differ significantly along the six dimensions mentioned above. However, regardless of their characteristics, no business game is faithful in all aspects of executive decision-making; at best it can be only a model or a reflection of reality.

Business simulation games have continued to be popular within the academic community. A recent survey (Faria, 1987) indicates that 95.1% of AACSB member schools are using computerized business games, mostly in business policy (52.9%) and marketing (51%) courses. The popularity of business games is fostered by the advancement of computer hardware and software technologies. While the earlier games required a mainframe computer, today, most of them can be run on personal computers (PC's). Furthermore, the recent advent of spreadsheet software has significantly augmented the player's ability to manipulate key variables in game play (Schachter, 1980), and produces a more positive attitude among players toward game play (Keys et al., 1988).

In contrast to the business game, the case method was introduced to the classroom at the Harvard Business School in the early twenties. A case "typically is a record of a business issue which

actually has been faced by business executives, together with surrounding facts, opinions and prejudices upon which executive decisions had to depend. These real and particularized cases are presented to students for considered analysis, open discussions, and final decision as to the type of action which should be taken" (Gragg, 1951). So along many dimensions, cases parallel games in their attempt to model reality for instructional purposes. Just as the business game becomes more complex with the addition of interactive variables, the case becomes more complex with the addition of a multitude of important issues affecting the executives' decision. According to Dooley and Skinner (1977), there are three factors influencing classroom pedagogy: 1) the educational objectives of the instructor, 2) the pedagogic philosophy of the instructor, and 3) the roles played by the students and the instructor. In using either the case or the business game, each of these factors must be addressed. Considering the first factor, the educational objectives of the instructor, coverage of the literature may be a critical concern. Some business games may be somewhat limited in covering all the issues and concepts addressed in the literature. Yet, a carefully selected case can help the student better understand the implications of a number of concepts emphasized in the literature. Nevertheless, business games are excellent in emphasizing the fundamental issues facing managers. They demonstrate the integration or interaction that invariably occurs among decisions made in the various functional areas. Often this latter concern is more important to the instructors who measure the course effectiveness in terms of the ultimate impact of the course on student behavior.

Generally speaking, the pedagogical orientation of the instructor involves such issues as the importance of instructor-student interaction, the role of written work in the course, the satisfaction and motivation of students in the class, the importance of hands-on learning, and the importance of group centered activity. Along these lines, the instructor may choose either cases or business games.

If the instructor is especially good at challenging and interacting with students in the classroom, the case method will be preferred. In this situation, the instructor actively leads the class and his or her role is critical to the success of the class. On the other hand, cases tend to be historical and the best of literature can be dated - a basis for many student complaints. This is not a concern in using business games. There is no "Monday morning quarterbacking." The students are in competition, which

adds meaning and "life" to the course. The role of students in trying to "win" is critical and, at a minimum, the time devoted by students not only influences the team's success but helps students really understand the management issues faced. Therefore, according to the Dooley-Skinner paradigm, the choice of cases or games becomes a personal matter for the instructor to decide.

The recent survey by Faria (1987) reveals that most deans and instructors in the AACSB member schools regarded the case method as the most effective teaching method. Yet those who used business games in classroom rated games as superior to cases. Raia (1966), Moore (1967), Wolfe (1973), and Wolfe and Guth (1975), among others, have conducted experiments comparing the teaching effectiveness of the case method versus business games. It can be concluded that games alone are superior to cases alone in terms of learning experienced in the course (Wolfe, 1973; Wolfe & Guth, 1975), that cases are superior to games for certain course topics (Moore, 1967), and that a combination of cases and games may be the most preferred teaching method (Raia, 1966), if both methods are properly administered. The question is then what type of combination is most appropriate. Raia (1966) adopted, for a business policy course, a set of cases along with one of two versions (simple or complex) of a computerized business game and found no significant differences in course performance between the two groups. However, in a game-only experiment, Wolfe (1978) found that a complex game is superior to intermediate and simple games in teaching effectiveness. These mixed results call for further investigation. The purpose of this study is to compare the perceived learning effects of mixing cases with either a simple or a complex game in a business policy course.

The Effective Use of Cases

The case method has considerable value for management education in that it reflects an actual experience and creates a learning situation that requires thoughtful reasoning and analysis. The case can reflect any given management situation realistically, focusing on any particular aspect of business. A case study requires students to incorporate prior knowledge and experience from other course work to accomplish the required analysis. Although a case never contains all the facts of a

situation, it forces the student to do the best they can with the information provided, which is similar to the actual situation faced by the executives in making their decisions.

A major disadvantage of the case method is that students cannot test their solutions. Without the classroom presentations of their proposed solutions, students would have no opportunity to evaluate the implementation of their recommendations. The critique of their solutions by the instructor and the other students is the only test of their ideas.

Other issues associated with the case method include: the selection of good and timely cases, and avoiding cases dealing with highly specialized subjects when the students do not have the background to understand the complexity involved. Finally, somewhat related to this problem is the need to avoid cases requiring excessive time for a satisfactory analysis (Wolfe & Guth, 1975, p. 362).

Success with the case method therefore depends a great deal on the type of cases used, the pedagogic philosophy of the instructor, the role of the student, the level of detail in the case, and the burden carried by students for written work or in-class discussions. Dooley and Skinner (1977) identify that the educational objectives for good applications of case method are to help students acquire skill in use of technique, acquire skill in analysis of business problems, acquire skill in synthesis of action plans, develop useful attitudes, and develop mature judgment/wisdom. As shown in TABLE 1, these educational objectives of the case method engender different roles of students and instructors, pedagogical skills, problems encountered, and measures of success.

INSERT *TABLE 1* ABOUT HERE

Ram Charan (1976) also suggests that beyond the actual conduct of the class, course design and the instructor's class preparation are critical concerns. He emphasizes the need to plan class time and the course workload to facilitate student learning. Cases must be selected with care to reflect student interests and build on course material. The instructor must carefully prepare for class by reading and rereading the case as if he/she were a student. The objective is to internalize the case so that no notes are required by the instructor to lead the class discussion. Charan further suggests

that to maximize the effectiveness of the case method, instructors should find out as much as possible about current company operations and the outcome of the situation depicted. Some of these suggestions may seem at variance with the Harvard approach propagated by Harvard faculty (McNair & Hersum, 1954; Merry, 1954; Bruns, 1970; Ladd, 1973; Corey, 1976; Hammond, 1976; Hargrove, 1976; Unterman, 1977; McKenney, 1979; Corey, 1981; Shapiro, 1984; Christensen, 1987; Applegate, 1989; Bonoma, 1989). Typically, the case method at Harvard is such that the discussion moves from pros to cons on various alternatives until a definite decision is clear to all participants. However, at the other end of the spectrum, some instructors "walk through cases" in a fashion that is tantamount to lecturing. Instructors in this mode control the time to permit an adequate discussion of issues. Students respond to instructor's questions and the instructor records their major points on the blackboard. As a matter of fact, most instructors do their blackboard planning prior to the class, carefully laying out their points to best utilize the board space available (Merry, 1954; Hargrove, 1976; Unterman, 1977; Corey, 1981; Bonoma, 1989).

Recently, Neeley and Pringle (1983) proposed the use of nominal group process (Van de Ven & Delbecq, 1971) as opposed to the traditional interacting group process to arrive at the best solution(s) to the case problem. They demonstrated that the nominal group process avoids letting one person dominate the session, promotes nonconformity and conflicting ideas, generates more alternatives, and tends to arrive at a better decision than is possible with the interactive process. However, regardless of the case complexity and the decision process used, a good case method should emphasize analytical techniques, introduce pertinent literature, and require outside field research; these techniques make a case study profitable beyond the solution to a given type of company problem. The rationale is that if students are required to carry the burden of class discussions, they will learn how to express themselves clearly and make quick, meaningful decisions.

Besides the case method, the case material is extremely important to the overall success of using case studies in the classroom. Paget (1988) suggests that the case method should require realism in the choice of case material and appropriately match the material and methods for the instructor and students involved. Cases must be selected with care to reflect student interests and

build on course material. Paget further states that the use of a case is contingent upon the objectives of the course, the institutional and program environment and the staff and students involved. A particular case may not be best for all purposes, for all students, or for all courses. Moreover, it is important that instructors consider the fact that no method is foolproof. "A badly handled case can be an academic horror. Improperly handled, a case is merely an elaborate means for confusing and boring students" (Paget, 1988, p. 179).

The Effective Use of Business Games

Just as the case method is a valuable method of instruction, the business game is a powerful teaching tool. Using business games in a classroom has several major advantages, as well as limitations. One advantage is that games have an added dimension that the case method alone will never have: they permit the student to see the consequences of their decisions (Zappia, 1986, p. 331). Furthermore, students participating in game simulation usually find it to be an exciting, different, and easier way of studying business policy in a simulated, real-world learning environment (Wolfe & Guth, 1975, p. 362). The game can bring more realism and excitement to the learning process while at the same time providing students with opportunities to make meaningful and intelligent executive-type decisions. However, adequate game play requires several decisions and, often, weeks to complete the learning cycle. Although quantitative skills can be improved by participating in a simulation game, some researchers have concluded that the game approach does not appear to be an effective means by which to improve the acquisition of applied and theoretical knowledge (Whiteley & Faria, 1989, p. 61).

Possibly the worst situation of some "childish" games is the fact that poorly prepared teams can outplay better teams because they are lucky. This comment is not intended to suggest removing risk or the unexpected events from game play. Taking risks should be rewarded; and although some aspects of the game should be hard to predict, the overall outcome of game play should not be based totally on chance. The game should be designed to reward students for careful analysis and long-term planning.

In our opinion, a good business game should realistically model the hypothetical

company's inner operations as well as its environment; react appropriately to competitor decisions; reward risk taking; permit reasonably accurate forecasts; and properly weigh long-term and short-term considerations. Typically, such features are seen in a more complex game which offers more options for players to consider. The result is more challenging decision making with an aura of realism in which each major functional area can influence the game outcome. Good games force students to plan for the long term, with their decisions reflecting a balance between long-term and short-term considerations. In the short-term, decisions should immediately affect the team's performance. For instance, if a team decides to lower prices and take smaller margins, the result should be higher demand, at least in the short run. Some games do not properly reflect this type of decision.

Biggs (1987) suggests that the features of business games can be classified into six categories: 1) competitive or noncompetitive, 2) industry specific or generic, 3) simple or complex, 4) team or individual design, 5) type of computer on which the game is to be run, and 6) the time period simulated. In choosing an appropriate game, instructors should consider the course objectives, the expected benefits, the equipment availability, and the learning process. It is recommended that a game be competitive since "competition gives students knowledge of their relative strengths, and is a powerful motivator to excellence" (Thavikulwat, 1988, p. 410).

Moreover, in order not to hinder the productive use of games in classes, some pitfalls should be avoided. For example, a complex game requires students to spend additional time to study the model. This leaves little time for readings or even lectures on course concepts and techniques. On the other hand, simple games are not realistic enough and sometimes fail to challenge students. From another viewpoint, business games rarely reflect the human side of the enterprise (Keys, 1987), nor do they fully reflect the actual environment encountered by the firm. Finally, many games are known to contain errors which negate their usefulness (Whitney, 1984). Such errors include program errors, logic errors, erroneous inappropriate programmed cost structure, inappropriate relationships of environmental variables, and poor use of random events. All of which will kill off student enthusiasm, especially if the student has devoted many hours to his/her analysis. Therefore, selecting a good game is essential to the effectiveness of a game course.

In all, the case method and the business game each has its own strengths and weaknesses. "The problem, therefore, is not to discover the one right method, but to use the most appropriate methods to enhance the type and level of learning we want students to achieve" (Paget, 1988, p. 177). By using a successful combination of both case and game methods, more learning benefits can be attained than when using the cases or games alone. It is this mixed pedagogy that we strongly support. The business policy course under experiment for this study therefore includes both cases and games.

Research Methodology

Subjects

The subjects of this study are the students enrolled in six class sections of an undergraduate business policy course at an AACSB member school. One hundred and fifty-nine students participated in the study. Students in each section were organized into six teams. The mix of students in each team approximates the mix of various business concentrations (i.e., accounting, finance, marketing, etc.). Furthermore, the school has extremely high entrance requirements for the undergraduate students. The students admitted into the business program usually represent the upper 10% of their peer group. They are not allowed to enroll in the business policy course unless they have completed all the business core requirements and are one or two quarters away from their graduation. This enrollment policy has helped us control the academic background and abilities of the participating students.

Course Design

As in most other AACSB member schools, the business policy course at this institution is a required capstone course. It integrates the knowledge of all business disciplines to accomplish the overall organization purposes through the exercises of business decision and policy making. The course objectives are as follows:

1. To increase the understanding of what managers must do to make business succeed over the long haul.
2. To develop the capacity to identify strategic issues and to reason carefully about strategic options.
3. To build the skills necessary to conducting strategic analysis in a variety of industries and competitive situations.
4. To extend the ability to formulate a strategic plan and then execute it successfully in a variety of organizational circumstances.
5. To improve the ability to manage the organization process by which strategies get formed and executed.
6. To integrate the knowledge gained in earlier business courses.
7. To better prepare the student for a successful career as a manager in most types of organization.

Based on these objectives, seven Harvard-type cases were selected to cover all the major issues to be discussed in the course. TABLE 2 shows the seven cases and the specific issues covered by each case. The case #2, People Express, was presented and discussed by the instructor to demonstrate the expected level of analysis from the students. Each student in the class was required to analyze five cases, present another case as a member of a team, read a textbook along with approximately 30 readings, and play a business game. In addition, each student took a quiz prior to the team presentation. The final examination covered the textbook, lectures, and readings. Furthermore, each team submitted three long reports, one on the assigned case and two covering game play (a strategy statement and a final report).

INSERT TABLE 2 ABOUT HERE

In addition, two business games of different complexity were used. The simpler game was randomly assigned to two class sections as the control group while the other classes used a more complex one. Students in the complex-game classes were assigned fewer readings to compensate their additional work for the game. TABLE 3 shows the characteristics of the two games evaluated in

this study. A comparison of the characteristics in TABLE 3 reveals that the simple game has a limited competitive market and its numbers of products, sales areas, production plants, and decision options are less than in the complex game. Furthermore, the simple game allows the players to buy and sell up to 8 companies in 8 different industries while the complex one does not allow them to do so.

This additional feature seems to provide the students with opportunity to attain the third course objective above (i.e., "To build the skills necessary to conducting strategic analysis in a variety of industries and competitive situations"). However, the ability to buy and sell companies is not likely to affect the level of experiential knowledge gained by the two groups of students during game play because most of the students' time would be spent on attaining the other six course objectives. Consequently, a multi-industry setting is not likely to cause any favorable reaction from the students toward either of the two games when they evaluate their learning from game play.

INSERT TABLE 3 ABOUT HERE

With respect to game play, most activities were accomplished outside of class. Each team submitted two game play reports and two short annual reports. Of the two game play reports, one is a strategy statement and the other is a final report. Typically, it took each team playing the complex game about four decisions to thoroughly understand the game. A team often spent a good four hours on one decision during the first few weeks of the class. Later on, each decision took less than an hour.

Research Variables and Hypotheses

Based on Raia's (1966) study, five research variables were identified for this study. These five variables correspond to five of Raia's criteria in organizing the business policy course. The first four of them are: 1) knowledge gained, 2) to familiarize students with the business environment, 3) to develop a top-management point or view, and 4) to provide insights into the tasks of functional managers. However, the fifth criterion, "to develop ability to apply sound management

concepts and techniques," was broadened into "to develop ability to integrate various skills required in successful teamwork." Moreover, one additional variable which is "time required by the course" was introduced by the authors for this study. The effects of the course activities on the outcomes concerning the above six variables are hypothesized as follows:

Hypothesis 1: A simpler game requires less time than a more complex game.

Hypothesis 2: Students playing a more complex game gain through game play more knowledge than those playing a simpler game.

Hypothesis 3: Students playing a more complex game gain a better familiarity with the business environment than those playing a simpler game.

Hypothesis 4: Students playing a more complex game gain more insights into the role of the top manager than those playing a simpler game.

Hypothesis 5: Students playing a more complex game gain more insights into the role of various functional managers than those playing a simpler game.

Hypothesis 6: Students playing a more complex game would gain a better ability to integrate various skills required in successful teamwork than those playing a simpler game.

Hypothesis 7: Good cases would be more valuable to students than playing a simple business game.

Questionnaire

Based on the above hypotheses, a questionnaire was designed to measure students' perception toward the effects of course activities on the six research variables. Except the time requirements, all the other items were measured by a 7-point Likert scale. In order to reduce bias in the course instruction, all the class sections were taught by the same instructor using the same syllabus except that two of the sections played the simpler game. This instructor was a senior professor having extensive experience in case method and business games. For case study, he followed the discussion format set by the Harvard approach. During game play, he was able to answer any questions about variable interactions and explain the results of any set of reasonable decisions. He has been using both pedagogies in classes for more than 10 years before this study took place. The

questionnaire for this study was administered to the subjects on the last day of class. All questionnaires were anonymously completed. As in all studies using a self-reporting instrument, the scores from the questionnaire indicate the teaching effectiveness only in terms of the students' perception of the teaching methods rather than some objective indicators. With objective indicators, one can investigate such questions as "How much is the difference in learning effects between student A and student B in the same class or two different ones?" and "How much is the difference in the average learning effects between the students in two different classes?" On the other hand, one can only examine the latter question using perception scores. Nevertheless, the purpose of this study is not to measure the absolute differences in learning effects between two individual subjects, but to compare the relative differences on the average between the two class groups. Therefore, the self-reporting perception scores appear to be appropriate for the analysis in this study.

Analysis

The research hypotheses for this study require the tests of significant differences in the effects of course activities on the six research variables. Since our questionnaire contains both ratio (the time requirement item) and ordinal scales (all the Likert-scale items), two statistical tests were used to identify the significant differences; one is the Student's *t* test and the other is the Mann-Whitney test. While the former test is for the ratio scale, the latter is for the ordinal one.

Results

TABLE 4 shows the summary statistics of the two class groups. The results of the *t* tests and the Mann-Whitney tests are highly consistent. The heavy workload in the course prompted the belief that students playing the simpler game would spend less time on the game. The results do not support this idea. The students reported spending the same amount of time on games in both groups (opposing *Hypothesis 1*, $p > 0.05$ from the *t* test), yet the student preparation time for the entire course in the simple game group had dropped. While the former may be due in part to the similarity in written assignments associated with game play, the latter may be due to an oversight of some

outside research activities which should have been considered in the time estimation. Based on the Mann-Whitney test, the students perceived they gained more knowledge from the complex game (supporting *Hypothesis 2*, $p < 0.001$) than from the simple game. In each of the five variables based on Raia's criteria, the students in the complex game play rated their experience as more valuable than those involved with the simple game. These include a gain in familiarity with the business environment (*Hypothesis 3*, $p < 0.01$), development of a top management viewpoint (*Hypothesis 4*, $p < 0.01$), insights into the tasks of business functional managers (*Hypothesis 5*, $p < 0.001$), and the ability to integrate functional skills (*Hypothesis 6*, $p < 0.001$).

INSERT TABLE 4 ABOUT HERE

Finally, the students on the simpler game were found to benefit more from their case work (supporting *Hypothesis 7*, $p < 0.001$) than the game itself as shown in TABLE 5. It is interesting to see that the reported gains in knowledge from the complex game play is somewhat higher than from the cases (5.18 versus 4.8, $p < 0.05$), indicating a complex game may offer similar results to a Harvard-type case. Furthermore, the knowledge gained from game play appears to be the highest (5.18) in the complex-game course while it is the lowest (3.59) in the simple-game course. TABLE 5 also indicates that the reported knowledge gain from the simple game play is as low as from the lectures/reading (3.59 versus 4.02, $p > 0.05$), that the knowledge gain from the complex game play is higher than from the lectures/reading (5.18 versus 4.39, $p < 0.001$), and that regardless of the levels of game complexity, the Harvard-type cases maintain a higher level of knowledge gained than the lectures/reading (5.18 versus 4.02 in the simple game class, $p < 0.001$; 4.8 versus 4.39 in the complex game class, $p < 0.05$). In all, the results of our experiment appear to support all the hypotheses, except the one referring to time requirements (see TABLE 6).

INSERT TABLE 5 ABOUT HERE

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Discussion and Conclusion

Case method or business games? This has been a controversial question for more than two decades regarding the pedagogy in business courses. Each of these pedagogies has its own strengths and weaknesses as discussed earlier in this paper. The best strategy might be to integrate both pedagogies and apply them concurrently to the delivery of instruction in the same course. This paper provides empirical evidence to support this strategy for the instruction of business policy courses.

It should be noted that the results of this study might have been different if we were not able to control the students' as well as the instructor's background and abilities. Further research is needed if one wishes to explore the effects of these factors on students' learning effectiveness.

Irrespective of the results of this study, it is clear that the way a class is organized and the expectations of the instructor play a major role in the accomplishments of the class. As a matter of fact, there is some evidence to indicate that cases and complex business games are almost interchangeable as models of reality for the business policy class. However, cases do have one advantage over business games in that real people are quoted and the details surrounding real situations can be explored. Students are often interested in the company under consideration and they can readily find out more information about the company through annual reports or even talk to the executives of the company. Regardless of the approach used, the student experience appears to be more important than the knowledge gained. The detailed descriptions of Harvard case analysis suggests the importance of the face-to-face interaction of the students and the apparent confrontation between students and the instructor. In some ways, this rich behavioral experience cannot be duplicated with business games. At the same time, game play puts the student closer to the role of an actual manager with responsibility for results.

In all, perhaps the most interesting conclusion drawn from this study is that cases and complex games play a similar role in the business policy course. They are tools to facilitate student learning through a realistic model of real-world business and should be used to supplement each other.

In choosing a business game, one should make sure the game is error-free and closely resembles reality. When a choice must be made between cases and simple business games, one should use cases because they tend to provide consistent learning effectiveness as long as they are not "fabricated or abbreviated" (Pigors, 1967).

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TABLE 1

Good Application of Case Methods

Educational Objective	Teacher's Role	Student's Role	Teacher's Skills and Talks (%)	Problems Encountered	Requirements for Success	Judging Success of Class
Acquire skill in use of technique	Question and probe to develop realism	Work out effective use of technique in business situation	Realistic recognition of problems in use of technique (33%)	Said to be too easy or too hard, too limited, or too universal	Realistically demanding case Teacher can restrain self from resolving problems	Practicality of student recommendations
Acquire skill in analysis of business problems	Probe Clarify Inter-relate	Analyze Determine cause/effect relationships by analysis of facts and inferences	Questions to open up areas for discussion Careful listening Sense of realism (10%)	Teacher domination, "telling," impatience, and solving problems	Student willing to work, desire to analyze problems, and feels of competent	Thoroughness, variety, completeness of analysis in breadth and depth
Acquire skill in synthesis of action plans	Challenge Question Extrapolate Role-play	Establish priorities and plan of action Develop possible outcomes and implications	Interpretation of student plan without domination (10%)	Teacher temptation to settle it with own ingenious analysis	Student feels he/she has necessary facts and is challenged to develop a viable solution	Creativity and realism of action plans
Develop useful attitudes	Lift up the problem of executive attitudes	Discuss/debate outcomes Personalize	Seeing problem from its many sides (10%)	Teacher imposition of own attitudes/values	Teacher trusts that attitudes emerge as a long-term by-product of a demanding education	Changes in attitudes, increased confidence, humility, responsibility
Develop mature judgment/wisdom	Give feedback Restate Listen	Discuss/debate Develop alternatives and their	Self-restraint Perception of student state of progress (5%)	Teacher impatience, inability to tolerate student	Teacher can tolerate student frustration	Waiting and trusting

		implications		frustration		
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Source: Adapted from Dooley & Skinner (1977).

TABLE 2

Major Issues Covered by the Cases

Cases	#2: People Express	#1: Ted Turner	#27: Lincoln Electric	#19: Dickenson Mines	#23: Campbel l Soup	#20: Exxon	#29: Wal Mart Stores
Major Issues							
Competitive Analysis	X					X	
Entrepreneurship	X	X					X
Ethics	X		X		X		X
Formulating Strategy	X	X		X	X	X	X
Financial Analysis	X	X	X	X	X	X	X
Human Resources	X		X				X
Organization, Staffing	X		X				
Portfolio Evaluation		X			X	X	
Resource Allocation	X			X	X	X	
Situation Analysis	X	X	X	X	X	X	X
Strategic Choice	X	X		X			
Strategic Leadership	X	X	X	X	X		X
Strategy Implementation			X	X			X

TABLE 3

Profile of Business Games Used in The Study

Features and Criteria	Simple Game (N=55)	Complex Game (N=104)
<i>Characteristics</i>		
Interactive market	Yes	Yes
Competitive market	Limited	Yes
Number of industries	8	1
Ability to buy/sell company	Upto8co	.0
Team size (# of persons in each team)	3-6	3-6
Number of products	1productpercompany	1newproductperdecision
Number of sales area	1/company	4
Number of production plants possible	1/company	5
Decision options		
Marketing	2	16
R & D	1	3
Personnel	-	5
Production	-	3
Investment	2	12
Decision time period	1Quarter	1Quarter
Required computer hardware	Microcomputer	Mainframe
<i>Instructor's Evaluation of Game Performance:^a</i>		
Well designed	C-	B+
Reaction to competitor moves	B	B
Long-term/short-term tradeoff modes	D	B+
Risk taking is rewarded	D	B
Ability to forecast	C-	B

^a On the scale of A, A-, B+, B, B-, C+, C, C-, and so forth, while A represents "Excellent."

TABLE 4

Comparing the Effects of Business Games at Two Levels of Complexity

Research Variables	Simple Game (N=55)		Complex Game (N=104)		Difference ^a	
	Mean	S.D.	Mean	S.D.	't' Test	Mann- Whitney
Average Time Required (hours/week):						
Game only	3.14	1.63	3.20	1.88	.839	.9840
Entire course	4.98	3.11	7.07	3.74	.001***	.0005***
Knowledge Gained:						
Game only	3.59	1.64	5.18	1.15	.000***	.0000***
Lectures/Reading only	4.02	1.55	4.39	1.21	.134	.1453
Cases only	5.18	1.34	4.80	1.22	.076	.0564
Did the game familiarize you with the business environment?	3.99	1.79	4.88	0.98	.001***	.0014**
Did the game help you develop a top management viewpoint?	4.27	1.39	4.94	0.93	.002**	.0040**
Based on game play, did you gain insights into the tasks of functional managers?	3.62	1.32	5.04	0.83	.000***	.0000***
Game play increased your ability to integrate various skills	4.25	1.34	5.13	0.90	.000***	.0000***

^a The difference between the complex and the simple business game is subjected to a two-tailed Student's *t* test and a two-tailed Mann-Whitney test.

* Significant at $p = 0.05$.

** Significant at $p = 0.01$.

*** Significant at $p = 0.001$.

TABLE 5

Comparing the Knowledge Gained from Three Course Activities

Knowledge Gained	Simple Game (N=55)		Complex Game (N=104)	
	Mean	S.D	Mean	S.D
Game only	3.59	1.64	5.18	1.15
Lectures/Reading only	4.02	1.55	4.39	1.21
Cases only	5.18	1.34	4.80	1.22
Comparison ^a	't'Test	Mann-Whitney Test	't'Test	Mann-Whitney Test
Game only versus Lectures/Reading only	.160	.2184	.000***	.0000***
Game only versus Cases only	.000***	.0000***	.025*	.0319*
Lectures/Reading only versus Cases only	.000***	.0001***	.014*	.0160*

^a The difference between each pair of course activities is subjected to a two-tailed Student's *t* test and a two-tailed Mann-Whitney test.

* Significant at $p = 0.05$.

** Significant at $p = 0.01$.

*** Significant at $p = 0.001$.

TABLE 6

Summary of Hypothesis Tests

Research Hypothesis	Decision	Probability
1. A simpler game requires less time than a more complex game	Opposed	0.8390 ^t
2. Students playing a more complex game gain more knowledge than those playing a simpler game through the game play	Supported	0.0000 ^m
3. Students playing a more complex game gain a better familiarity with the business environment than those playing a simpler game	Supported	0.0014 ^m
4. Students playing a more complex game gain more insights into the role of the top manager than those playing a simpler game	Supported	0.0040 ^m
5. Students playing a more complex game gain more insights into the role of various functional managers than those playing a simpler game	Supported	0.0000 ^m
6. Students playing a more complex game would gain a better ability to integrate various skills required in successful teamwork than those playing a simpler game	Supported	0.0000 ^m
7. Good cases would be more valuable to students than playing a simple business game	Supported	0.0000 ^m

^t Based on the two-tailed Student's *t* test.

^m Based on the two-tailed Mann-Whitney test.