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A strategy for teaching decision-making skills utilizing simulation techniques

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A STRATEGY FOR TEACHING DECISION-MAKING SKILLS UTILIZING SIMULATION TECHNIQUES

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APPROVAL SHEET

We the undersigned do certify that we have read this dissertation and that in our individual opinions it is acceptable in both scope and quality as a dissertation for the degree of Doctor of Education.

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Chapter 1

Introduction

From the literature it would seem that a major development of the 1970's will be a new emphasis upon career counseling. A report of the Subcommittee on Career Guidance of the Committee on Specialized Personnel, Manpower Administration, U. S. Department of Labor in 1967 began with the words:

> Work can be viewed as man's aim and end; or as his instrument. Whatever the view, our Nation can no longer afford the vagueness, haphazardness, and error to which individuals are so frequently abandoned in their career choices. The fate and welfare of the United States and its people are now, and for some time will remain, substantially dependent on . . . the cultivation and employment of the Nation's talent. (Robb, 1969, p. 1)

Extensive research has been conducted in the area of career choice, and many different vocational theories have been postulated. These theories, however, seem to have had little effect upon actual practices by counselors in the field. In the decade of the seventies there will be an increasing need for counselors to focus upon ways to familiarise students with basic sources of knowledge concerning the world of work and to provide them with essential information about available options in career choice. Counselors will be called upon to help the student develop skills and abilities which will enable him to shape his own vocational destiny.

Osipow, in a speech delivered at Ohio State University, noted that to be uninformed is to be without a choice. He believes that people react to their environments and follow those avenues educationally and vocationally which they perceive to be open to them with a minimum of difficulty. This approach to career decision making suggests that students need to expand their knowledge and understanding of the labor market and to learn to make decisions which will enable them to leave open the maximum number of alternatives so that they may sharpen the focus of their career direction as they mature. The challenge to counselors, then, is to develop career programs which are designed

- to provide students with a broad view and understanding of the complex world of work, and
- to prepare students with decision-making skills.

Theoretical Background

During the earliest days of the guidance movement, the predominant vocational guidance model was the one proposed by Frank Parsons. According to his model for matching men and jobs, an individual reaches a point in time, usually in late adolescence, when he must make a career decision. The professional literature and guidance practices were often focused on helping the individual make an appropriate onetime, final career choice.

In the 1950's Eli Ginsberg, an economics professor at Columbia University who was interested in the effective utilization of manpower, presented a theory of vocational choice which was in conflict with the limited view of the Parsonian model. Ginsberg's

theory directed attention to the developmental aspects of career choice. The four basic elements of his theory are:

1. Vocational choice is an ongoing process and extends over a long period of time.
2. The process is characterized by a series of stages. The three major distinguishable stages are the fantasy stage (from ages 6 to 10), the tentative stage (from ages 11 to 18), and the realistic stage (from age 18 up).
3. The process is largely irreversible. One's choices are narrowed as he progresses through various stages.
4. Vocational choice is a compromise whereby an individual seeks to maximize his job satisfaction by utilizing his interests and capacities while at the same time satisfying as many of his values and goals as possible (Ginzberg, Ginsberg, Axelrad, & Herma, 1951).

Although the reaction of vocational psychologists and counselors was initially critical, Ginzberg's framework of career development was soon accepted as a cogent and provocative model. His developmental approach had the effect of making the professionals more receptive to the later work of Donald Super and other theorists.

The theory of vocational development proposed by Super (1969b) has evolved over a long period of time. He draws his concepts from

various disciplines and has labeled his approach, which is broader than Ginzberg's, as ". . . differential-development-social-phenomenological psychology (p. 9)." The four major elements of his theory are:

1. Vocational life stages. The stages of vocational development, which are patterned after Buehler's psychological life stages, are: growth (birth to age 14), exploration (from ages 15 to 24), establishment (from ages 25 to 44), maintenance (from ages 45 to 65), and decline (from age 65 to death).
2. Vocational maturity. The basic assumption underlying the concept of vocational maturity is that vocational behavior develops systematically with increasing age and that certain modal behaviors or tasks can be identified for the various developmental stages. These vocational developmental tasks, patterned after Havighurst's developmental tasks, are identified; and the utilization of this concept paves the way for the construction of indices to assess the maturity of one's vocational behavior (Super, 1969a).
3. Vocational self-concept. A vital part of this theory is the utilization of the self-concept. Drawing from phenomenological theories, Super (1969b) postulates that ". . . in expressing a vocational

preference, a person puts into occupational terminology his ideas of the kind of person he is, that, in entering an occupation, he seeks to implement his self-concept, and, that, in stablizing in an occupation, he attempts to achieve self-actualization . . . (p. 7)."

4. Career patterns. Although all individuals proceed through the general developmental stages, they may vary with respect to the sequence and duration of various vocational activities. By specifying different career patterns, Super allows for a more specific description of the vocational development of the individual.

Super's theory is descriptive of the developmental process and emphasizes the longitudinal quality of man's growth and development. It is, perhaps, the most widely accepted theory of vocational choice.

The theories of both Ginzberg and Super involve choice or decision making and have spurred the study of the dynamics of decision making by other theorists. Since these theories provide a general orientation for understanding vocational behavior, the decision theorists have tended to concentrate more specifically on analyses of the decision process.

Gelatt (1962) has developed a sequential decision-making model (see Figure 1) and has suggested its use in secondary school

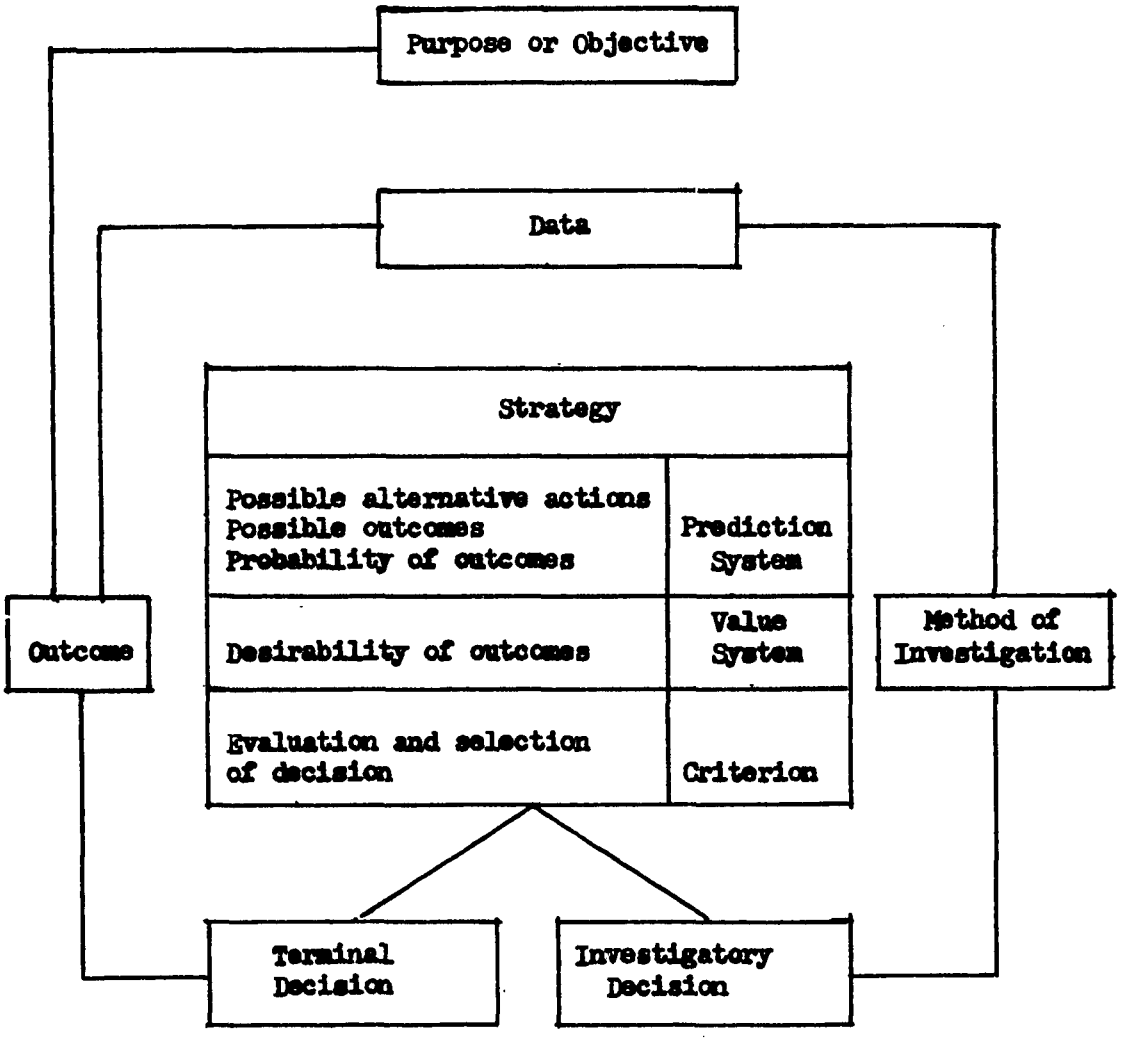

Figure 1. Gelatt's sequential decision-making process

guidance programs. According to this model, decision making is based on the following assumptions:

1. An individual is aware that he must make a decision.
2. He is aware that he needs information.
3. He has at least two alternative courses of action (Gelatt, 1962).

Utilization of data is central to the process. Three assumptions basic to data collection are:

1. Relevant information is a necessary condition for good decision making.
2. The quality of the decision is related to the degree of relevant information possessed by the individual.
3. Relevant information can be reduced to a few basic classes (Clarke, Gelatt, & Levine, 1965, p. 41).

With adequate information a strategy can be developed which involves a predictive system for assessing possible outcomes, a value system for weighing the desirability of outcomes, and a decision criterion for integrating and selecting an appropriate action (Gelatt, 1962, p. 241). When a decision is made, it may be either terminal or investigatory. There is feedback into the cycle from either type, and each decision influences future decisions. Decisions are viewed, then, as cyclical and continuous.

A six-year experiment was conducted by the secondary school guidance program in Palo Alto, California, utilizing Gelatt's sequential decision model. The focus of the guidance program was on improving the quality of educational and vocational decision making. One of the outcomes of this research was the development by Gelatt and his associates of educational materials designed to teach decision-making skills to high school students.

Need for the Study

Although decision making is practiced by everyone each day of his life, to date it has had little or no formal, systematic place in the educational curriculum. Super (1960), in his study The Vocational Maturity of Ninth-Grade Boys, recommended that the curriculum be organized to foster planfulness and ". . . to arouse an awareness of the need to make pre-occupational and occupational choices, and to orient adolescents to the kinds of sequences of choices which they will be called upon to make and to the factors which they should consider in making these choices (p. 158)."

Gelatt (1962) suggested that decision-making theory could provide a conceptual framework for counselors because "through decision-making counseling students are required to learn more about themselves and their environment as this information is related to the decision, and by participating in the decision-making process they can learn to make decisions more independently and accept the proper responsibility (p. 241)."

Other counseling experts (Tyler, 1961; Wrenn, 1962; and Goldman, 1961) have also identified assisting individuals in learning how to make good decisions, plans, and choices as primary tasks of counseling. Goldman (1961), for example, states that:

> An almost universal characteristic of counseling . . . is that it deals with decisions and plans . . . and counseling is usually to give help in making decisions and plans for the future and in choosing among alternative courses of action in the world of reality (p. 25).

Clarke (1965) and his associates are even more specific in cautioning that it is not safe to assume that an awareness of information results in effective decision making. They feel an individual may need assistance in acquiring ". . . an effective strategy for analyzing, organizing and synthesizing information in order to make good decisions (p. 41)."

More attention has been devoted to the theoretical aspects of decision making than to the development of strategies or methods for teaching decision-making skills to secondary school students. One potentially powerful instructional device which focuses on the practical aspects of decision making is the simulation game. Over the past few years several simulation games have been devised for educational use. Those that have received the most attention have been the ones used by college business schools and corporations in their management training programs. The values of such games arise from several sources and are summarized by Boocock and Coleman (1966) as:

- It brings the future into the present and enables the student to play at those roles which he must

play in earnest as an adult. In this manner he learns skills that are relevant to those roles without paying real-life consequences for his actions.

- The games have a unique motivating ability.
- The outcome of the game is objectively decided.

Although there has been an increase in the use of simulation games, evaluation of the games as supplementary teaching aids has largely been impressionistic; and there has been little in the way of empirical data to support the inclusion of such games in the school curriculum. The paucity of research and the inconclusiveness of the results of those studies which have been conducted suggests the need for further research to look for new strategies, including possible ways of combining methods so that the best results can be obtained.

Purpose of the Investigation

In a review of the literature only one pilot project was found in which specific attention was given to developing decision-making skills prior to or concomitantly with the simulation games, although such skills are inextricably involved in all of them. It would seem that students participating in the games operated on a trial-and-error basis when making decisions that affected their success or failure with the simulation method.

It would seem to follow from educational theory that learning is enhanced if students are taught how to do something and then given an opportunity to practice or use the new skills they have acquired.

The purpose of this investigation is to attempt to determine what effects, if any, different methods of presenting educational and career information produce in the areas of career attitudes and decision-making skills. In addition, student perceptions and parent perceptions of the various methods will be examined.

Two commercially available items, the Life Career Game and Deciding will be utilized. Boocock (1968) described the Life Career Game as follows:

> The Life Career Game is a simulation game played by teams of two to four players. Each team works with a profile of a fictitious student. The game is organized into rounds representing one year in the life of the student. During each round players plan a schedule of activities for a typical week, allocating the student's time among school, studying, a job, family responsibilities and leisure-time activities. Players must choose a combination of activities which they think will maximize their person's present satisfaction and his chance for a good life in the future.
>
> When players have completed a round, scores are computed in four areas--education, family life, occupation and leisure. Calculators use a set of tables and spinners--based upon U. S. Census and other national survey data--which indicates the probabilities of certain things happening in a person's life, given his personal characteristics, past experiences and present efforts. Chance is built into the game by use of spinners and dice to enable students to gain some understanding of probability theory.
>
> After a designated number of rounds, usually 8 to 12, the team with the highest total score is the winner (p. 108).

Deciding is a new course of study on decision making developed by Gelatt, Varenhorst, and Carey. It is designed to teach junior high

school students how to make well-informed and well-considered decisions about themselves, their education, and their future.

Statement of the Problem

By utilizing these two approaches to decision making, an attempt will be made to discover:

1. What, if any, measurable differences in attitudes are elicited among groups by the use of the Life Career Game, Deciding, and a combination treatment?
2. What, if any, measurable differences in decision-making skills are elicited by the various treatment methods?
3. What, if any, measurable differences in student perceptions of the various treatment methods are elicited?
4. What, if any, measurable differences in parent perceptions of the various treatment methods are elicited?

Hypotheses

For statistical purposes, the following hypotheses were formulated:

H_1: Students participating in the combination treatment will acquire significantly more cognitive skills, as measured by responses to items on the Career Maturity Inventory,

than those students receiving the other treatments.

H_2: Students participating in the combination treatment will have their attitudes, as measured by responses to items on the Career Maturity Inventory, significantly changed relative to the attitude changes produced by the other treatments.

H_3: Students participating in the combination treatment will be significantly different from students receiving the other treatments on student perceptions which are elicited concerning the various methods.

H_4: Parents of students participating in the combination treatment will perceive this group to be significantly better decision makers than parents of students receiving the other treatments.

Definition of Terms

The following terms have been defined for the purposes of the proposed investigation:

Simulation game. A teaching device, with rules of play and a method of determining a winner, in which an environment is created to provide the participants with realistic problem-solving experiences related to their present or future work (Cruickshank, 1966).

Life Career Game. A simulation game developed at Johns Hopkins University to simulate features of the American school, marriage, and labor markets. It is designed to give students familiarity with the types of decisions that must be made about jobs, further education, family life, and use of leisure time.

Deciding. A course of study published by the College Entrance Examination Board which is designed to teach junior high school students how to make well-considered decisions.

Career Maturity. An organized set of behaviors and attitudes that enable an individual to successfully meet the demands in his environment. It also involves making decisions and taking responsibility for them (Tolbert, 1974, p. 76).

Career Maturity Inventory (CMI). An inventory designed by Dr. John O. Crites (1965) to measure the maturity of attitudes and competencies that are seen as being critical in realistic career decision making. (The attitude section of this instrument was formerly known as the Vocational Development Inventory.)

Decision-making Skills. Problem-solving abilities and competencies that pertain to the career choice process and that are measured by the Competence Test of the CMI.

Attitudes. Conative aspects of career decision making which are measured by the Attitude Test of the CMI.

Chapter 2

A Review of Relevant Research

Intuitively, simulation games seem to hold great promise for the teaching of decision making, which is the primary purpose for their creation. Although there has been no single, comprehensive research study which stands as a classical example of the effectiveness of this strategy, the numbers of studies investigating this approach have been steadily increasing. The studies have varying degrees of sophistication with regard to the research design and analysis of the data.

A review of the literature is limited to simulation games used in an educational setting and suggests that the trend has been away from impressionistic reports of game effectiveness. Increasingly, researchers have attempted to develop empirically some categories of things which might be learned in games. A review of related research has suggested that they could be grouped in the following categories: (1) attitudes, (2) cognitive learning, (3) decision making and problem solving, and (4) interests. It is not unusual for a study to investigate more than one of the above facets of gamesmanship. Generally, however, one effect seems to receive primary consideration. In addition, a miscellaneous category has been included for the several studies which seem unrelated to the above classifications under which the literature has been presented. It seemed pertinent to present this final group of studies

because they suggested nonconventional uses of simulation techniques which hold promise for improving the choice process.

Attitudes

Buchanan (1972) investigated the effectiveness of the Life Career Game (LCG) in increasing vocational maturity. The theory base for the study originated in the work of Crites (1965), who postulated

- that students, regardless of age, who are exposed to similar information regarding vocations and career planning exhibit similar behavior, and
- that students who are provided with relevant information will develop a more mature outlook regarding vocational choice.

The researcher hypothesized that participation in the LCG would significantly increase the vocational maturity of adolescents.

Subjects were 42 seventh- and eighth-grade students at a junior high school in Fairfield, California. The participants were enrolled in a civics class, which is an elective course. Using a pretest-posttest design, there was one experimental group and one control group. The Attitude Test of the Vocational Development Inventory (VDI) was administered to both groups. Following the pretest, the experimental group participated in the LCG for 8 two-hour sessions; the control group continued with the regular civics curriculum. At the conclusion of the experimental period the measurement instrument was re-administered.

Using a one-tailed t test to analyze the data, the hypothesis was supported at the .01 level of confidence. A second hypothesis that the vocational maturity of females, as measured by the VDI, would be less than that of males was rejected; and the reverse was found to be true.

In a pilot project in the Palo Alto Unified School District, Varenhorst (1972) directed a study which made use of both the LCG and a decision-making unit. Subjects were 310 pretest students and 272 posttest students who were selected in random class-size units from the eighth grade of a junior high school. A 36-item questionnaire to assess attitudes was designed and administered for both the pretest and posttest. Four experimental treatments were administered by classroom teachers, counselors, and a school psychologist. Group I used the LCG, Group II used the decision-making unit, Group III used both the LCG and the decision-making unit, and Group IV used a special combination of the LCG and the decision-making unit. The control group received no treatment.

It was hypothesized that significant attitude changes would occur in one or more of the experimental treatment groups while no attitude changes would occur in the control group. Examination of the data, using one-way analysis of variance, revealed no significant differences between the experimental groups and the control group. Reasons which were advanced to explain these findings were

- that the experimental treatments may have had no identifiable results,

- that the experimental treatments may have produced unanticipated results, and
- that the criterion measure may have been ineffective.

Shirts (1966) conducted a pilot project in which the Life Career Game was used with sixth-grade students. Using three experimental groups and three control groups from two school districts, the game was played for a total of 15 hours. The Vocational Development Inventory was utilized to determine whether any changes in career attitudes had taken place. Analysis of the data revealed that no significant differences existed between the treatment and control groups.

Clarke (1970), in a study designed to evaluate the effects of simulation in the social studies curriculum, reported on a simulated national nominating convention which was held in 1968, an election year. The objectives of the study were to increase student motivation and involvement in political activities and to develop positive attitudes toward our political system.

Participating in the research were grades ten, eleven, and twelve in three high schools. In one of the schools a simulated convention, involving 900 students, was held. Random samples from the two high schools which were not involved in the simulation served as control groups. To evaluate the objectives of the research, an instrument based on Osgood's Semantic Differential was administered at the conclusion of the experiment. After analyzing the data it was concluded that the simulated convention was effective in accomplishing the stated

objectives. Information concerning the statistical treatment of the data was not included in the report of the study.

Boocock (1972) used gaming to investigate the nature of intergenerational relations. The game used in the research was a revised version of Generation Gap. This is a "two-person game in which players taking the roles of an adolescent and one of his parents attempt to resolve disagreements over a variety of issues concerning the child's behavior (p. 31)." Subjects in the study were 17 real-life parent-child pairs. They participated in a two-hour playing session.

Before the session, each player completed a questionnaire concerning issues which were considered to be sources of greatest conflict in most families. For each issue the player was asked to indicate the degree of parental restriction. He was also asked to indicate on a five-point scale how strongly he felt and how strongly he thought his partner felt about each issue. Following the simulation the researcher conducted a debriefing session to solicit comments concerning the game experience. Then, the players were asked to complete another questionnaire.

Correlation coefficients and associations between a number of game variables were examined. Results which were relevant to attitude change were inconclusive but pointed to the resolution of conflicts through this gaming strategy.

Lee and O'Leary (1971) designed a controlled experiment to investigate the learning effects of simulation on attitudes. The Inter-Nation Simulation, a game developed by Guetzkow and Cherryholmes, was

selected for the study. "In the specific case of INS, students have the opportunity to live through the mounting of international tensions and conflicts, they have to make decisions under conditions of uncertainty and ambiguity, and they have to live with the consequences of these decisions (p. 314)." In an effort to establish ideal conditions for the study, an experienced teacher conducted the game, the players were given advance preparation, the game extended over a three-day period, and there was an extensive postgame discussion.

Subjects for the experiment were high school seniors whose socio-economic background was characterized as lower-middle-class white. An experimental group of 34 participated in INS and a control group of 41 played Boocock's Life Career Game. A questionnaire developed for the study was administered approximately two weeks before and four weeks after the study. Analysis of covariance was used to measure the effects of the simulation experience. The major finding from this experiment was that there was an increase in the students' tolerance of ambiguity. It was concluded by the investigators that this attitude change could assist students in functioning more effectively in complex and ambiguous decision-making environments.

Livingston (1972) reports on two studies he conducted using the simulation game Democracy. In both studies junior high school students played the game as part of their regular social studies class. It was hypothesized that playing the game would result in greater acceptance of the practice of "log-rolling" (voting agreements between congressmen) and would increase the belief that students can understand and influence political actions (political efficacy).

In Study I 48 ninth-graders participated, and in Study II approximately 200 eighth-graders participated. Nine classes were involved in the study. The students in each class were randomly divided into two groups. For two class periods the experimental group played Democracy, and the control group played the simulation game Trade and Develop, which does not involve politics or the legislative process. A pretest-posttest design was used, and the same questionnaire was administered to all participants.

Using a *t* test to analyze the data, the hypothesis that playing Democracy would increase students' tolerance of "log-rolling" by congressmen was supported at the .05 level of confidence for both studies. The researcher concluded that this finding added support for the generalization that simulation games can increase one's level of tolerance and approval for the real-life person whose role he takes in the game. Results with regard to the hypothesis that participation in the game would increase students' feelings of political efficacy were ambiguous and inconclusive. While Study I showed a statistically significant effect, Study II did not.

Cognitive Learning

Baker (1966) studied the effects of simulation games with respect to students' immediate learning and their retention of the material learned. The subjects, 131 eighth-graders at a junior high school in Illinois, were randomly assigned to four American history classes. The simulation method was used in two classes and conventional

teaching methods were used in two classes. A knowledge test relevant to the historical period covered was developed and administered before and after the experiment. The test was re-administered after a period of six weeks in order to measure retention.

Analysis of variance, significant at the .01 level, supported the hypothesis that simulation was more effective than traditional teaching methods. On the retention test the simulation students remained superior to those students who were taught by traditional methods, but the significance level had decreased to .05.

Wing (1966) investigated the use of two computer-based economics games with elementary students. The simulations involved one student playing "against" a computer. Of particular interest to the researcher was a comparison of conventional classroom methods with simulation methods.

Subjects in the experimental group were 25 sixth-grade students. Each student played both games. A comparable control group used conventional classroom methods. A pretest-posttest design was used, and the criterion measure was a test which had been prepared for the project.

The results were inconsistent. On one of the simulations the experimental group performed significantly better (at the .01 level) while on the other simulation the reverse was true. It was concluded that no claim of learning superiority could be made by the simulation or the conventional method.

In a study by Boocock and Coleman (1964), 1,200 young people who were attending a 4-H Club conference were randomly assigned to one or the other of two simulation games (Life Career Game and Legislative Game). The subjects ranged in age from 13 to 20. Over 80% of the

participants said they were in the top half of their high school classes academically; over 70% expected to graduate from college. The games were played in a single half-day session. A pretest-posttest design was used.

Among the specific findings of this study were the tendency for players of the career game to do better on some "quiz-type" questions relating to material covered in the game than those who played the Legislative Game. In general, it was ascertained through open-ended questionnaires that game players gained confidence in their ability to act effectively in given situations and gained an appreciation of the complexity of the real-life situation. However, it was difficult to quantify such information and to test its significance. The major shortcomings of this study were

- the unrepresentativeness of the sample,
- the inability to make a comparative evaluation of alternative methods of teaching the same materials, and
- the failure to designate an adequate criterion measure for evaluating the results.

Robinson, Anderson, Hermann, and Snyder (1966) conducted a study with 134 college students using a modification of the Inter-Nation Simulation Game. Course requirements were that students attend 2 one-hour lectures and a three-hour lab each week. All the students received the same lectures. For the lab experience the group was divided into two sections. The experimental group participated in a simulation section, and the control group participated in a case-study section.

It was predicted that the simulation group would perform significantly better on both fact-mastery and principles. Equivalent tests were administered before and after the experiment. Utilising a pretest-posttest design, data were quantified and an analysis of covariance was used to analyze the results. No significant differences were revealed between the groups. It was concluded that the expectations for the simulation were not borne out and that it was not uniformly superior to the case study as a supplementary teaching activity.

Fletcher (1971) reported on a large-scale field study to evaluate two social studies simulation games, the Bow and Arrow Hunting Game and the Crossing Place Hunting Game. The study was conducted in twelve elementary schools, involving 370 fifth- and sixth-graders and 17 teachers.

In the research design intact classes were used and were randomly assigned to the experimental conditions. There were four experimental groups but no "no-game" control group. Instead of an overall time limitation, it was specified that each group play the games a set number of times. It was hypothesized that students who received feedback from playing the game and discussed previous strategies would improve at playing the game and would learn more factual information than students who did not receive feedback. A pre- and posttest questionnaire was developed to evaluate factual learning that had occurred. A t test was used to analyze the data. It was concluded that game play is improved and factual learning is increased by reflection on the game experiences.

Anderson (1970) designed a study to investigate whether a simulation experience is more effective for learning factual information than conventional classroom methods. The investigator chose the simulation game Consumer because the game author had structured cognitive learning into the game strategy.

Subjects for the experiment were 280 high school seniors. Ten intact class groups were assigned to experimental or control groups. Since class groups in this school were formed on the basis of whether a student was in a college preparatory or general education curriculum, an effort was made to have approximately equal numbers of each group represented in the experimental and control conditions. Three teachers were involved in the study and each taught sections by both the simulation and conventional methods. In the experimental groups the simulation game was used; in the control groups teachers were instructed to teach a unit of instruction with techniques which represented their usual style of teaching. The time allotted for the study was six class periods.

Following the instruction, a knowledge test was administered to all students. The test, consisting of multiple choice and true-false questions, related to the use of installment credit. The test score was used as an indicator of the extent to which factual learning had occurred. Analysis of variance was used to analyze the data and revealed that there were no statistically significant differences between the groups. The investigator concluded that the simulation method was not superior to conventional classroom methods in learning to answer factual questions related to the use of installment credit.

Johnson and Euler (1972) investigated the effects of the Life Career Game on the learning of educational and occupational information. It was hypothesized that students playing the LCG would learn more factual information and would retain the information longer than students taught an occupational unit by conventional classroom methods.

Subjects for the study were 39 students enrolled in a ninth-grade citizenship class. The instrument that was used for pre- and posttesting was the Educational and Occupational Information Exam (EOIE). Following the pretest, students were randomly assigned to two groups. Students in the simulation group played the game one hour a week for six weeks. The control group was taught an occupational unit for the same period of time. Different instructors conducted the groups. Following the treatment, all students were again tested with the EOIE. Then, after a period of four weeks, with no intervening treatment, all of the students were again measured by the EOIE.

"A two-factor (sex and treatment) analysis of covariance was used to analyze the EOIE post-test and retention scores, using the pre-test scores as the covariate (p. 157)." Examination of the data on learning effects revealed that students taught by teachers learned more than students playing the Life Career Game. In analyzing the effects of the treatments on retention, no significant differences were found between the two groups. This finding was interpreted by the researchers to mean that the LCG group retained more information than the teacher-taught group. This interpretation was based on the fact that the teacher-taught group had learned significantly more educational information but that four weeks later the information that was retained was equivalent to the LCG group.

Another experiment designed to evaluate the effects of simulation on cognitive learning was a study conducted by Heinkel (1970). Involved in this study were two junior college political science classes, consisting of 67 students. Intact classes were used and treatments were randomly assigned. The simulation game NAPOLI (National Politics) was played by the experimental group, and the conventional lecture method was used with the control group. The same teacher taught the four-hour unit to both classes. A 100-item questionnaire was administered to pre- and posttest students.

To test the null hypothesis relative to cognitive learning, analysis of covariance was used. Interpretation of the resulting F ratios revealed that there was no significant difference in cognitive learning between students in the simulation group and students taught by the lecture method. The investigators noted that the criticism that students do not learn as much by simulation as by other methods was not supported.

Chartier (1972), after reviewing the literature on simulation games used in educational settings, reached the conclusion ". . . that simulation games are not better than conventional classroom methods with respect to imparting content (p. 203)." Following a suggestion made by Boocock and Schild (1968) that the games may need to be linked to other methods in order to maximize learning effects, he designed an experiment which related group discussion to simulation games. He hypothesized that "when simulation games and discussion are combined into a single learning experience, the learning outcomes are greater than simulation without discussion or discussion without simulation (p. 204)."

Subjects for this experiment were 133 undergraduates who were randomly selected from the students enrolled in the introductory speech communication courses during the 1971 spring quarter at the University of Denver. The simulation game Generation Gap was used for this investigation. The subjects were randomly assigned to four experimental groups. These groups were simulation with discussion, simulation without discussion, discussion without simulation, and no discussion-no simulation. Seven doctoral candidates administered the experimental conditions and were trained by the investigator prior to the experiment. The seven facilitators were randomly assigned to the experimental conditions.

The amount of time that was allotted for completion of the learning task was 75 minutes. Immediately following the learning experience an achievement test, consisting of 25 items, was administered. The achievement test had been developed to assess the following five levels of cognitive learning: knowledge, comprehension, analysis, synthesis, and evaluation. Test scores were analyzed by using the Kruskal-Wallis One-Way Analysis of Variance by Ranks to determine if the subjects' learnings in the experimental conditions differed significantly from each other. No statistically significant differences at the .05 level were revealed for any of the five levels of cognitive learning. The research hypothesis that subjects who participated in a simulation game with discussion would demonstrate higher cognitive learning outcomes than subjects participating in simulation without discussion, discussion without simulation, or no discussion-no simulation was rejected. The investigator concluded that the results of this study supported the fact that simulation games were

not better than conventional classroom methods with regard to cognitive learning.

Cherryholmes (1966), in a review of six studies using game simulations, reported that the contention that participants in a simulation learned more facts or principles than they would have learned by studying in a more conventional manner was not supported. Factors which seemed to contribute to the disappointing findings of the studies were

- the problem of designating an adequate criterion measure,
- the failure to recognise that the complex nature of the simulations seems to necessitate gradual involvement so that the player is not overwhelmed at the beginning,
- the inadequate training of leaders to conduct the games,
- the representativeness of the samples, and
- the nature of the experimental design which has been utilised.

Decision Making and Problem Solving

A study previously cited (Robinson et al., 1966) gave attention to the effects of simulation on decision-making abilities. The Watson-Glaser Test of Critical Thinking was administered to participants. No significant differences were found among the treatment groups and it was

concluded that students did not make measurable gains in critical abilities and techniques.

Cherryholmes (1966) reported that in a study by Garvey and Seiler an attempt was made to measure the effects of the Inter-Nation Simulation on decision-making abilities. Subjects were high school students, and the experiment extended over a period of six weeks. The Watson-Glaser Test of Critical Thinking and the Cornell Critical Thinking Tests were used to assess the results of the experiment. Analysis of the data did not confirm the hypothesis that decision-making abilities were enhanced by simulation methods.

Interests

With regard to concern about the value of games in the classroom, one of the most consistent claims has been that they generate interest and increase motivation to learn. In studies previously cited which collected data on student interest in simulation games, Boocock (1966), Wing (1966), Buchanan (1972), Lee and O'Leary (1971), and Shirts (1966) were unanimous in their findings that students evidenced a high degree of interest and positive motivation. In studies conducted by Varenhorst (1972), Robinson et al. (1966), Livingston (1972), and Johnson and Euler (1972), participants did not perceive the simulation games as an interesting activity.

The results obtained in the above studies would seem to indicate that the data are inconclusive and that simulations, as learning

devices, may not be the most popular approach when compared with other instructional methods.

Other Research

Broadbent and Meehan (1971) developed a simulation to be used for the in-service training of teachers. The purpose of the simulation was to increase the competence of teachers in recognising learning disabilities in the classroom. The simulation was designed as a six-hour workshop. To test the effectiveness of the simulation, a study was conducted which used the entire faculty of a small elementary school (a total of 17 persons) as the experimental group. The control group was a group of teachers enrolled in a graduate course in education.

Two instruments were developed to assess the effectiveness of the simulation. One of the instruments consisted of three micro-simulation situations. Each participant reacted to a series of statements concerning each situation. A t test of the difference between the means of the experimental and control groups revealed that the experimental group was significantly more skilled in recognizing learning problems and in selecting procedures for further assistance in diagnosis and planning. The second instrument was an opinionnaire that was administered to the experimental group. Analysis of the responses indicated that the teachers considered the simulation to be an effective method of in-service training for regular classroom teachers.

Kasdon and Kelly (1969) utilized the simulation method for an in-service training program for reading teachers. The purpose of the investigation was to determine whether pupils of teachers who participated in the in-service simulation program were assigned reading materials more appropriate to their instructional reading levels than pupils of teachers who did not participate. An effort was also made to determine whether the time of the school year when an in-service simulation was scheduled made any difference in its effectiveness.

A three-group posttest-only research design was utilized in the study. Each group, consisting of a stratified sample of 32 teachers from grades two through five, was randomly selected and assigned. One experimental group participated in the simulation prior to the opening of school, a second experimental group participated in the simulation in the latter part of October, and the control group received no treatment. Analysis of the data supported the hypothesis that teachers who participated in the simulation prior to the opening of school assigned reading materials more appropriate for pupils' instructional reading levels. The investigators interpreted this finding to mean that simulation must be used before teachers have developed a set regarding prevailing instructional practices.

Burke and Sage (1970) used a simulation in an education in-service training program for purposes other than those for which it had been designed. Assuming that school administrators preferred to keep special education students out of regular classes, a simulation game designed to train personnel to assume leadership roles in special education

was used in an effort to change the administrators' attitudes toward the integration of these students into regular classes. It was hypothesized that as a result of the simulation school administrators would be more willing to accept more special education students into regular classes.

Subjects for the study were 19 administrators who participated in a three-day workshop using the simulation game. A pre- and posttest design was used and there was no control group. Data was analyzed by analysis of variance. Of the ten concepts that were measured, all except one changed in the hypothesized direction. It was concluded that the idea of using the simulation in this manner was sound and that greater results could possibly have been obtained if the workshop had been lengthened somewhat.

Kidder and Guthrie (1972) designed an experiment to evaluate the training effects of a behavior modification game Modifying. It was designed to help teachers develop skills involving behavior modification techniques in teaching children specific tasks.

Subjects for the study were 42 education students. They were randomly assigned to one of four treatments: game, lecture, game-brief discussion, and game-discussion-game. After completing their treatments, subjects were randomly assigned to one of two test conditions. In one condition a written test was administered and was followed by a performance test. In the second condition the procedure was reversed.

Multivariate analysis of variance was used to analyze the data. The results suggested that the game-discussion-game treatment was the

most effective treatment. This finding prompted the investigators to conclude that an effective way to improve the training effects of a simulation game is to play it twice with a discussion between plays. Although no significant differences were reported with regard to the test order, it was observed that the performance on either test was generally higher when it was the first test taken by the subjects.

Braskamp and Hodgetts (1971) conducted a study to determine whether identifiable personality characteristics were present in participants who performed well in a game simulation. The game Top Management Simulation, developed by Hodgetts, was used in the study.

Subjects for the experiment were 37 college seniors and 4 graduate students who were enrolled at the University of Nebraska in administrative policy classes. To obtain information on various personality traits, three tests were administered to each participant. The three tests were the Strong Vocational Interest Blank, the Omnibus Personality Inventory, and the Watson Glaser Test of Critical Thinking. Each participant's grade-point average was also obtained from college records. Following the testing and a practice round, the group was divided into teams and the simulation began. In this game points are awarded and a winner can be determined.

Correlation coefficients were used to analyze the data. The results revealed that there were no significant relationships between personality traits and game performance. An inverse correlation was obtained between grade-point average and game success. The investigators concluded that it may be possible that students with low grade-point

averages are highly motivated by this practical approach while students with high grade-point averages are penalized because of the interaction skills that are required in group participation.

Summary

A persistent claim which has been made for simulation activities is that they hold great potential for bringing about behavior changes, and in recent years the use of such activities in an education setting has increased. This increased use of simulation games has led researchers to investigate the effectiveness of this new educational tool. A review of the research by Chartier (1972) revealed two major conclusions about simulation games used in educational settings: "(1) that simulation games generate more interest in subject matter than do more conventional classroom activities, and (2) that simulation games are not better than conventional classroom methods with respect to imparting content (p. 203)."

On the basis of these findings, some simulation scholars have suggested that games may need to be linked to other instructional methodologies in order to maximize learning outcomes (Boocock & Schild, 1968). In this investigation an inquiry will be made into the value of linking simulation games with the learning of specific decision-making skills. At the present time, there seems to be no reported research of the cognitive and affective learning outcomes from linking a simulation game experience with a unit of study designed to teach students how to make decisions.

Chapter 3

Population

In January 1974, two junior high schools in the Chesapeake Public Schools, Chesapeake, Virginia, participated in a research study designed to investigate the effects of special units of instruction on career decision-making skills. Four classes enrolled in ninth-grade English at Indian River Junior High School and four classes enrolled in eighth-grade social studies at Great Bridge Junior High School took part in the study. Involved in the study were a total of 210 students and two teachers.

Methodology

Prior to the experiment the two special units, Deciding and the Life Career Game, were distributed to the teachers who had volunteered to participate in the study. After they had had an opportunity to examine the materials, a one-day training session was conducted by the investigator at Great Bridge Junior High School. The purpose of the session was to learn how to play the Life Career Game. Attending the meeting were the two teachers and ten students, who had been selected by the teachers to be scorers for the Life Career Game. The investigator also held two other joint meetings with the teachers. At those meetings plans for teaching the units were discussed so that uniform procedures would be followed at both schools.

The experiment was conducted five days a week, during the regular class period, over a six-week period. In each school there were three experimental groups, Deciding, the Life Career Game, and a combination of the two units, and a control group, which received no treatment but continued with regular classwork. The treatments were randomly assigned to intact classes in existence with their regularly assigned teacher at each school.

At the completion of the study two test instruments were administered to the students. The first instrument was the Career Maturity Inventory, which contains an Attitude Scale and a Competence Test. The Attitude Scale consisted of 50 true-false items, and the Competence Test consisted of 100 multiple-choice items. The second instrument was a student questionnaire consisting of seven yes-no items. Two class periods were required for student completion of the evaluation instruments. Parent opinion, as to the effectiveness of the decision-making units, was also solicited at the beginning and at the end of the study.

Experimental Design

Three research designs were formulated which would be functionally fitted to testing the hypotheses which have been generated by this study. By structuring various designs to fit the research questions that have been asked, the chances of statistically arriving at accurate and valid conclusions were improved.

Hypothesis 1

Hypothesis 1 states that students participating in the combination treatment will acquire significantly more cognitive skills, as measured by responses to items on the Career Maturity Inventory, than those students receiving the other treatments. In relation to research Hypothesis 1, the following statistical hypotheses were tested:

H_0: The four treatment means are equal, that is,

$$A_1 = A_2 = A_3 = A_4.$$

H_1: The four treatment means are not equal, that is,

$$A_1 \neq A_2 \neq A_3 \neq A_4.$$

Statistical tests of research Hypothesis 1 and the related null hypothesis were conducted according to a one-way classification of analysis of covariance (see Table 1). The independent variable consisted of four levels: A_1, control group; A_2, Deciding group; A_3, Life Career Game group; A_4, Deciding-Life Career Game (Combo) group. The control variables were intelligence and age.

Hypothesis 2

Hypothesis 2 states that students participating in the combination treatment will have their attitudes, as measured by responses to items on the Career Maturity Inventory, significantly changed relative to the attitude changes produced by the other treatments. In relation to research Hypothesis 2, the following statistical hypotheses were tested:

H_0: The four treatment means are equal, that is,

$$A_1 = A_2 = A_3 = A_4.$$

H_1: The four treatment means are not equal, that is,

$$A_1 \neq A_2 \neq A_3 \neq A_4.$$

Table 1

Analysis of Covariance Paradigm

for Hypothesis 1

Treatments												
A_1 Control			A_2 Deciding			A_3 Life Career Game			A_4 Combination		
X_1	X_2	Y	X_1	X_2	Y	X_1	X_2	Y	X_1	X_2	Y

X_1 = Intelligence test scores

X_2 = Age

Y = CMI Competence Test scores

Statistical tests of research Hypothesis 2 and the related null hypothesis were conducted according to a one-way classification of analysis of covariance (see Table 2). The independent variable consisted of four levels: A_1, control group; A_2, Deciding group; A_3, Life Career Game group; and A_4, Deciding-Life Career Game (Combo) group. The control variables were intelligence and age.

Hypothesis 3

Hypothesis 3 states that students participating in the combination treatment will be significantly different from students receiving the other experimental treatments on student perceptions which are elicited concerning the treatments. In relation to Hypothesis 3, the following statistical hypotheses were tested for the criterion of treatment methods:

H_0: The means of the three experimental treatments are equal, that is, $A_2 = A_3 = A_4$.

H_1: The means of the three experimental treatments are not equal, that is, $A_2 \neq A_3 \neq A_4$.

Statistical tests of research Hypothesis 3 and the related null hypothesis were conducted according to a chi-square test of independence. Data were classified in a bivariate frequency distribution as indicated in Table 3. The two variables were student response and treatment method. The purpose in studying the relationship between the two variables was to determine if the classification of student response was independent of classification of the treatment method or if one was contingent upon the other in some way. Although there were only three levels of the treatment

Table 2

Analysis of Covariance Paradigm

for Hypothesis 2

Treatments												
A_1 Control			A_2 Deciding			A_3 Life Career Game			A_4 Combination			
X_1	X_2	Y	X_1	X_2	Y	X_1	X_2	Y	X_1	X_2	Y	

X_1 = Intelligence test scores

X_2 = Age

Y = CMI Attitude Scale scores

Table 3

Two-by-three Contingency Table

for Hypothesis 3: Treatment Effects

and Student Questionnaire Responses

	Student Response	
Treatment	Yes	No
Deciding		
Life Career Game		
Combination		

variable, they were labeled A_2, A_3, and A_4 to conform with the identical variable of research designs for Hypothesis 1 and Hypothesis 2.

Hypothesis 4

Hypothesis 4 states that parents of students participating in the combination treatment will perceive this group to be significantly better decision makers than parents of students receiving the other experimental treatments. In relation to Hypothesis 4, the following statistical hypotheses were tested for the criterion of treatment methods:

H_0: The means of the three experimental treatments are equal, that is, $A_2 = A_3 = A_4$.

H_1: The means of the three experimental treatments are not equal, that is, $A_2 \neq A_3 \neq A_4$.

Statistical tests of research Hypothesis 4 and the related null hypothesis were conducted according to a chi-square test of independence. The two variables were parent response and treatment methods. Data were originally classified in a bivariate frequency distribution which took the form of a 3 x 5 contingency table (see Table 4). For practical purposes, the data were collapsed into a 3 x 3 contingency table (see Table 5), and an examination was made to determine if the classification of parent response was independent of classification of the treatment method or if one was contingent upon the other in some way. The levels of the treatment variable were labeled A_2, A_3, and A_4 to conform with the identical variable of the previous research designs.

Table 4

Three-by-five Contingency Table

for Treatment Effects and Parent

Rating Scale, Original Data Collection

	Parent Response				
Treatment	Excellent	Good	Average	Fair	Poor
Deciding					
Life Career Game					
Combination					

Table 5

Three-by-three Contingency Table

for Hypothesis 4: Treatment Effects

and Parent Rating Scale Responses

	Parent Response		
Treatment	Better	Same	Worse
Deciding			
Life Career Game			
Combination			

Independent Variable

Treatment

Treatment, the active variable, consisted of four levels or groups:

Group I - Deciding

Group II - Life Career Game

Group III - Combination of Deciding and Life Career Game (Combo)

Group IV - Control

In the group using Deciding, the emphasis was on career decision-making. This included the rationale and principles of making decisions and practice in using decision-making concepts and skills. Three units of work were built around the

- examination and recognition of personal values,
- knowledge and use of adequate, relevant information, and
- knowledge and use of an effective strategy for converting this information into an action (Gelatt et al., 1972).

A second group participated in the Life Career Game, a simulation developed by Dr. Sarane Boocock of Johns Hopkins University. This activity attempts to imitate or simulate the job, education, and marriage markets as they currently exist in this country.

Teams of students become decision-makers for a fictitious person presented to them in the form of a profile or case history. The objective

of the game is to plan the most satisfying life for the person. Each team is in competition with other teams working with the same profile. Scores are awarded in four areas for each round of the game; and from a total score that is computed at the end of the game, a winning team can be determined.

The four areas in which scores are awarded are: (1) education, (2) job, (3) family life, and (4) leisure activities. Teams must plan courses for their student to take in order to graduate from high school. Grades for these respective courses determine the education score. If the student is employed, he receives a score in the job category based upon income and number of hours worked. Family life is another area in which points are awarded. These scores are based on the number of hours spent doing household chores. If the individual marries, the score is a function of education, number of years married, and number of children. Finally, points are awarded on the number of hours spent for leisure activities. These vary according to the personality profile of the individual.

At the end of a round, which is one year in the life of the person, each team computes its score. Then, the team draws a card from a set of unplanned event cards, which introduce variables into the profile for which adjustments have to be made. Such an event could be a job loss, an illness, or an unplanned child.

The rationale for playing the game is that students are exposed to the kinds of information necessary to plan their own lives. They are confronted with the necessity for clarifying values, establishing

goals, and working out strategies in order to reach these goals. During the course of the game, they become aware of the many factors impinging on an individual as he makes a vocational choice.

A third group received a combination treatment of Deciding and the Life Career Game. The time that was spent on the combination unit was approximately equally divided between the two approaches to teaching decision making.

The control group for testing Hypothesis 1 and Hypothesis 2 received no treatment and proceeded with routine classwork.

Assigned Variables

Many variables influence and complicate educational research problems. Among the variables which seem to constantly need control and which were incorporated in the research design to test the first and second hypotheses were intelligence and age.

Intelligence

It is obvious that an individual's intelligence plays a significant part in his vocational development and decision making, helping to shape his behavior by moving him to or away from certain choices. Intelligence was built into the design because of previous research which had indicated it is an important factor in vocational choice (Berdie, 1953; Davis, Hagan, & Strouf, 1962; Elton, 1967; Hays & Rothney, 1961; Jones, 1940; Little, 1967; Mowesian, Heath, & Rothney, 1966; Porter, 1954).

Age

Age is another crucial variable in vocational decision making. Vocational maturity is a prominent element in vocational development theories. As it is generally presented, however, the concept seems to be descriptive of what happens when no purposeful intervention to facilitate individual decision-making behavior is introduced. With the rapid and high level of development of today's youth, research seems to indicate that a student can learn to make vocational preferences as early as the third grade (Astin, 1967; Davis et al., 1962; Flores & Olsen, 1967; Gribbons & Lohnes, 1967; Madsen & O'Hara, 1967; McDaniels, 1968; Thompson, 1966).

Dependent Variables

The Career Maturity Inventory (CMI), developed by Dr. John O. Crites, was administered as a posttest to all students who had participated in the investigation. The two measures that it provided were an attitude score and a competence score. Each of these measures was used to test a research hypothesis.

Hypothesis 1

The dependent variable to test Hypothesis 1 was the total score of the Competence Test of the CMI. The total score was composed of five subtest scores: self-appraisal, occupational information, goal selection, planning, and problem solving.

Hypothesis 2

For research Hypothesis 2, the dependent variable was the score of the Attitude Scale of the CMI. This portion of the CMI was formerly known as the Vocational Development Inventory.

Criterion Measures

Criterion measures to test the four research hypotheses were based upon three instruments: the CMI, a student questionnaire, and a parent rating scale.

Career Maturity Inventory

An instrument which seemed to be relevant to the objectives of the study and which was selected for testing Hypothesis 1 and Hypothesis 2 was the CMI. The two types of measures which it provided were the Attitude Scale and the Competence Test.

The Attitude Scale is designed to elicit the conative aspects of decision making. The reliability of the scale has been appraised by computing internal consistency estimates and by determining test-retest stability coefficients. The average internal consistency coefficient is .74 and is comparable to those of similar instruments. The stability coefficient over a one-year period is .71 (Crites, 1973). Many studies have been conducted on the Attitude Scale, and the research seems to indicate that it has an acceptable level of content, construct, and criterion validity (Asbury, 1968; Bartlett, 1968; Crites, 1971; Crites & Semler, 1967; Heilbrun, 1960).

The Competence Test is designed to elicit the cognitive aspects of decision making. The five sections of the test are self-appraisal, occupational information, goal selection, planning, and problem solving. The only reliability estimate which is presently available is for internal consistency and the coefficients generally range from .72 to .90 across grade levels. Validity data is being collected, and the information that is available seems to suggest that it is a useful measure for evaluating

career programs (Crites, 1973). Since the Competence Test is still in the research stage, caution was taken in interpreting and generalising from its findings. However, the skills it purports to assess were relevant to this research; and it is believed that it will provide an acceptable measure of this aspect of the study.

Student Questionnaire

A questionnaire was formulated by the investigator to assess student attitude toward the instructional unit in which he had participated. The questionnaire was patterned after a similar instrument which was developed by Varenhorst (1972).

The questionnaire was administered at the conclusion of the experimental treatment, and students were asked to anonymously indicate their honest opinion concerning the instructional unit. The first item in the questionnaire was changed to reflect the specific treatment which each group received. All other items were identical, regardless of treatment. The instrument contained the following items:

1. You have just completed a unit which included Deciding and the Life Career Game. Did you like the unit?
   _____yes _____no
2. Would you advise your friends to participate in it if they had a choice? _____yes _____no
3. Was the time you spent worth what you learned from the unit? _____yes _____no
4. Do you think you covered things in the unit that are not covered elsewhere in school? _____yes _____no

5. Did the unit overall increase your knowledge about making decisions involving important life situations?

   _____yes _____no.

6. Did the unit overall increase your ability to cope with important life situations? _____yes _____no

7. Have you used what you learned in the unit outside of class? _____yes _____no.

Parent Rating Scale

A parent rating scale was developed to assess whether students were exhibiting improved decision-making skills outside of a regular classroom environment after participating in the experimental treatments. The 16-item scale contained concepts and learnings that were incorporated in the instructional units. The same scale was completed by parents before and after the special units. The directions were changed to reflect whether the student was just beginning a decision-making unit or completing the unit. The scale was presented as follows:

DIRECTIONS: The purpose of the following scale is to determine where your teenager is as he starts a special unit on decision-making. Use the scale below to rate his skills. Put a check (✓) in the appropriate box on the scale.

A = Very similar in ability to an excellent decision-maker.

B = Close to the best but not quite as skilled as the best.

C = Does a reasonably good job.

D = Has to learn more about how to do this in order to become really good.

E = Needs a lot more experience with this in order to be able to do it satisfactorily.

Our teenager:	A	B	C	D	E
1. Knows how to go about getting information he needs in making decisions.					
2. Is aware of the importance of values in making decisions.					
3. Uses his own goals, values, and beliefs to establish clear objectives for himself.					
4. Develops new alternatives or possible actions when the available ones are not satisfactory.					
5. Ranks various possible outcomes of a decision on the basis of their desirability for him.					
6. Differentiates between routine and critical decisions.					
7. Analyzes the special nature of a critical decision including its long-range consequences and the closing off of future opportunities.					
8. Uses a strategy for making critical decisions.					
9. Knows high school graduation requirements and the educational options open to him in life planning.					

	A	B	C	D	E
10. Uses his time wisely, alloting adequate time for study, leisure, cultural, and recreational pursuits.					
11. Can collect and organise information about his abilities, interests, and values which affect his choices of school and career goals.					
12. Sets short-term goals for himself and then works to achieve them.					
13. Sets tentative long-range career goals and plans a high school program to help him reach his goals.					
14. Knows his personal strengths and weaknesses.					
15. Understands how his personal characteristics can affect the school and work goals he eventually will choose.					
16. Understands the typical activities of workers in different occupational fields.					

_____
(Signature of Parent)

Treatment of the Data

When all data were assembled at the completion of the study, scores on the CMI were available for 202 of the original 210 students.

Criteria scores were not available for eight subjects who were absent during the test periods or had withdrawn from school. The summary of the number of students completing the CMI has been presented in Table 6.

The student questionnaire was administered only to the three experimental treatment groups. Questionnaires were received from 151 students. The summary of the number of students completing the instrument has been presented in Table 7.

The parent rating scale was administered only to parents of students involved in the three experimental treatments. The response received on the rating scale was low, with only 69 parents completing the instrument at both the beginning and the end of the study. Follow-up instruments were sent out three times in an effort to maximize the number of completed rating scales. The summary of the number of parent responses to the rating scale has been presented in Table 8.

As an aid in analyzing the data, scores were randomly deleted from the study so that the statistical analyses were conducted on equal sample sizes. Li (1964) lists the advantages of the use of equal samples over the use of unequal samples as follows:

1. It facilitates computation.
2. It minimizes the effect of heterogeneity of population variances.
3. The probability of committing a type II error is minimized for a given total number of observations (p. 197).

Table 6

Summary of Number of Students

Completing the Career Maturity Inventory

Treatment	Grade		Total
	8	9	
Deciding	25	22	47
Life Career Game	25	24	49
Combination	21	32	53
Control	27	26	53
Total	98	104	202

Table 7

Summary of Number of Students

Completing the Student Questionnaire

Treatment	Grade 8	Grade 9	Total
Deciding	29	22	51
Life Career Game	29	22	51
Combination	21	28	49
Total	79	72	151

Table 8

Summary of Number of Parents

Completing the Parent Rating Scale

Treatment	Grade		Total
	8	9	
Deciding	18	7	25
Life Career Game	14	10	24
Combination	11	9	20
Total	43	26	69

Using equal sample sizes for the purpose of statistical computation has resulted in analyzing responses from 188 subjects on the Career Maturity Inventory, 147 subjects on the student questionnaire, and 60 subjects on the parent rating scale. The composition of the groups completing each measurement instrument, using equal sample sizes, has been presented in Tables 9, 10, and 11.

Statistical Analysis

One-way classification analysis of covariance was used to test Hypothesis 1 and Hypothesis 2. The two control variables were intelligence and age. Table 12A contains the summary data of the subjects' IQ range, and Table 12B contains the summary data of the subjects' age range. In the school system in which the experiment was conducted, the California Test of Mental Maturity (CTMM) is administered at the seventh-grade level and the Lorge-Thorndike Intelligence Test is administered at the sixth-grade level. Intelligence test scores were obtained from students' permanent records. The CTMM score was used as the intelligence covariate; if it was not available, the Lorge-Thorndike score was used. The subjects' ages were easily determined from information recorded on the answer sheet of the Career Maturity Inventory.

The chi-square statistic was used to test Hypothesis 3 and Hypothesis 4. For each hypothesis the data were classified in a contingency table and tested to determine if the two variables were independent of each other.

Table 9

Composition of Groups Completing the Career Maturity Inventory Using Equal Sample Sizes

Treatment	Grade		Total
	8	9	
Deciding	25	22	47
Life Career Game	24	23	47
Combination	19	28	47
Control	24	23	47
Total	92	96	188

Table 10

Composition of Groups Completing

the Student Questionnaire

Using Equal Sample Sizes

Treatment	Grade		Total
	8	9	
Deciding	28	21	49
Life Career Game	28	21	49
Combination	21	28	49
Total	77	70	147

Table 11

Composition of Groups Completing

the Parent Rating Scale

Using Equal Sample Sizes

Treatment	Grade		Total
	8	9	
Deciding	13	7	20
Life Career Game	10	10	20
Combination	11	9	20
Total	34	26	60

Table 12A

Summary of the IQ Data of the

Experimental and Control Students

for Hypotheses 1 and 2

	Treatment				
IQ	Deciding	Life Career Game	Combination	Control	Total
140-149	0	0	1	0	1
130-139	1	1	2	2	6
120-129	4	4	3	1	12
110-119	4	7	9	12	32
100-109	13	14	11	11	49
90-99	12	4	15	10	41
80-89	6	6	2	7	21
70-79	3	8	1	3	15
60-69	4	3	3	1	11
Total	47	47	47	47	188

Table 12B

Summary of the Age Data of the

Experimental and Control Students

for Hypotheses 1 and 2

	Treatment				
Age	Deciding	Life Career Game	Combination	Control	Total
18	0	1	0	0	1
17	0	0	0	0	0
16	3	0	1	2	6
15	16	10	15	14	55
14	21	24	24	25	94
13	7	12	7	6	32
Total	47	47	47	47	188

Levels of Significance

Levels of significance for testing all hypotheses were set at .05. The corresponding confidence levels were .95.

Chapter 4

Results

The purpose of this investigation was to attempt to discover the answers to the four questions stated earlier:

1. What, if any, measurable differences in decision-making skills are elicited among groups by the use of the Life Career Game, Deciding, and a combination method?
2. What, if any, measurable differences in attitudes are elicited by the various treatment methods?
3. What, if any, measurable differences in student perceptions of the various treatment methods are elicited?
4. What, if any, measurable differences in parent perceptions of the various treatment methods are elicited?

The hypotheses that were formulated for this research study involved four treatment groups. These groups were Deciding group, Life Career Game group, combination group of Deciding and Life Career Game, and control group. The major hypotheses were that students in the combination group would outperform those in the other groups. The statistical results for the hypotheses are reported separately.

Hypothesis 1

Hypothesis 1 states that students participating in the combination treatment will acquire significantly more cognitive decision-making skills, as measured by items on the criterion variable, than students participating in the other treatments. The treatments consisted of four levels: Deciding, Life Career Game, combination of Deciding and the Life Career Game, and control.

Using a posttest only, control-group design, the data were subjected to a one-way classification analysis of covariance to test the hypothesis. The covariance analysis, holding intelligence and age constant, produced the F-ratio of 1.375. At the .05 level, this was not a statistically significant value (see Table 13).

The means and standard deviations of the four groups on the Competence Test of the CMI are presented in Table 14. Examination of the means reveals a slight trend in the hypothesized direction. These results indicate that students in the combination group performed somewhat better on the criterion measure than the other groups. It appears that students participating in a combination of Deciding and the Life Career Game made greater gains in cognitive decision-making skills than students participating in the other treatments. However, the standard deviations were quite large; and with such large standard deviations, it is difficult to obtain significant differences among the treatments.

The research hypothesis that students who are taught decision-making skills through a combination treatment will score significantly

Table 13

Analysis of Covariance of Experimental and Control Students' Scores on the Competence Test of the Career Maturity Inventory Controlling for Intelligence and Age for Hypothesis 1

Source of Variation	df	Residuals: Sum of Squares	Residuals: Mean Square	F
Between	3	428.156	142.719	1.375
Within	182	18,897.129	103.830	
Total	185	19,325.285		

Table 14

Summary Data of the Experimental and Control Students' Scores on the Competence Test of the Career Maturity Inventory for Hypothesis 1

Treatment	n	M	SD
Deciding	47	53.234	14.973
Life Career Game	47	56.872	15.367
Combination	47	60.021	12.962
Control	47	57.426	14.328

higher on the Competence Test of the CMI than students taught by other methods was rejected. For Hypothesis 1, the null was accepted. There were no statistically significant differences in cognitive decision-making skills among the four treatment groups.

Hypothesis 2

Hypothesis 2 states that students participating in the combination treatment will have their attitudes, as measured by responses to items on the Career Maturity Inventory, significantly changed relative to the attitude changes produced by the other treatments. This means that students in the combination treatment will exhibit behavior that is more vocationally mature than students in the other treatments. The four treatment levels were: Deciding, Life Career Game, combination of Deciding and the Life Career Game, and control.

Tests of Hypothesis 2 were conducted according to a single-classification analysis of covariance. The covariance analysis, controlling for intelligence and age, produced the F-ratio of 0.675. This was not a statistically significant value at the .05 level (see Table 15).

Table 16 shows the means and standard deviations for each of the four treatment groups on the Attitude Scale of the CMI. Inspection of the means reveals a very slight trend in the hypothesized direction. Students in the combination group scored slightly above students in the other groups. It appears, however, that the treatment effects on attitude changes are negligible if controlled for intelligence and age. In this study, attitudes seem to remain fairly constant regardless of experimental conditions.

Table 15

Analysis of Covariance of Experimental and Control Students' Scores on the Attitude Scale of the Career Maturity Inventory Controlling for Intelligence and Age for Hypothesis 2

Source of Variation	Residuals df	Sum of Squares	Mean Square	F
Between	3	53.902	17.967	0.675
Within	182	4,842.418	26.607	
Total	185	4,896.320		

Table 16

Summary Data of the Experimental and Control Students' Scores on the Attitude Scale of the Career Maturity Inventory for Hypothesis 2

Treatment	n	M	SD
Deciding	47	32.298	5.938
Life Career Game	47	31.596	6.490
Combination	47	33.638	5.723
Control	47	31.936	6.302

The research hypothesis that students who are taught decision-making skills through a combination treatment will score significantly higher on the Attitude Test of the CMI than students taught by other methods was rejected. For Hypothesis 2, the null was accepted. There were no statistically significant differences in attitudes among the four treatment groups.

Hypothesis 3

Hypothesis 3 states that students participating in the combination treatment will be significantly different from students receiving the other treatments on student perceptions which are elicited concerning the various methods. Tests of Hypothesis 3 were conducted according to a chi-square analysis of a 2 x 3 contingency table of frequencies of student responses (see Table 3, p. 57). One variable consisted of yes-no responses. The three levels of the second variable were Deciding, Life Career Game, and combination.

Chi-square tests were computed for student responses to each of the seven items on the student questionnaire.

Student Questionnaire: Item 1. Table 17 contains the statistical data for Item 1: "Did you like the unit?" A chi-square statistic of 1.57155 was obtained. At the .05 level, this was not a significant value. The null hypothesis was accepted. For student response to Item 1 of the student questionnaire, there were no statistically significant differences among the groups.

Student Questionnaire: Item 2. Table 18 contains the statistical data for Item 2: "Would you advise your friends to participate

Table 17

Data Tabulation for the Chi-square Analysis of a Two-by-three Contingency Table for Hypothesis 3: Student Questionnaire: Item 1

Treatment	Student Response		Total
	Yes	No	
Deciding	42 (42.6667)[a]	7 (6.3333)	49
Life Career Game	41 (42.6667)	8 (6.3333)	49
Combination	45 (42.6667)	4 (6.3333)	49
Total	128	19	147

Note.--Questionnaire Item 1: "Did you like the unit?"

[a]Expected frequencies in parentheses

Chi square = 1.57155, df = 2

Table 18

Data Tabulation for the Chi-square Analysis of a Two-by-three Contingency Table for Hypothesis 3: Student Questionnaire: Item 2

Treatment	Student Response: Yes	Student Response: No	Total
Deciding	42 (41)[a]	7 (8)	49
Life Career Game	38 (41)	11 (8)	49
Combination	43 (41)	6 (8)	49
Total	123	24	147

Note.--Questionnaire Item 2: "Would you advise your friends to participate in it if they had a choice?"

[a]Expected frequencies in parentheses

Chi square = 2.09146, df = 2

in it if they had a choice?" A chi-square statistic of 2.09146 was obtained. At the .05 level, this was not a significant value. The null hypothesis was accepted. For student response to Item 2 of the student questionnaire, there were no statistically significant differences among the groups.

Student Questionnaire: Item 3. Table 19 contains the statistical data for Item 3: "Was the time you spent worth what you learned from the unit?" The resulting chi-square statistic was 3.50668. This was not a significant value at the .05 level. The null hypothesis was accepted. For student response to Item 3 of the student questionnaire, there were no statistically significant differences among the groups.

Student Questionnaire: Item 4. The data tabulation for Item 4: "Do you think you covered things in the unit that are not covered elsewhere in school?" is contained in Table 20. The calculated chi square of 1.50472 was not significant at the .05 level. The null hypothesis was accepted. On student responses to Item 4 there were no statistically significant differences among the groups.

Student Questionnaire: Item 5. The data tabulation for Item 5: "Did the unit overall increase your knowledge about making decisions involving important life situations?" is contained in Table 21. The calculated chi square of 1.14706 was not significant at the .05 level. The null hypothesis was accepted. On student responses to Item 5 there were no statistically significant differences among the groups.

Table 19

Data Tabulation for the Chi-square Analysis of a Two-by-three Contingency Table for Hypothesis 3: Student Questionnaire: Item 3

Treatment	Student Response		Total
	Yes	No	
Deciding	47 (43.6667)[a]	2 (5.3333)	49
Life Career Game	42 (43.6667)	7 (5.3333)	49
Combination	42 (43.6667)	7 (5.3333)	49
Total	131	16	147

Note.--Questionnaire Item 3: "Was the time you spent worth what you learned from the unit?"

[a]Expected frequencies in parentheses

Chi square = 3.50668, df = 2

Table 20

Data Tabulation for the Chi-square Analysis of a Two-by-three Contingency Table for Hypothesis 3: Student Questionnaire: Item 4

Treatment	Student Response		Total
	Yes	No	
Deciding	44 (42.3333)[a]	5 (6.66667)	49
Life Career Game	40 (42.3333)	9 (6.66667)	49
Combination	43 (42.3333)	6 (6.66667)	49
Total	127	20	147

Note.--Questionnaire Item 4: "Do you think you covered things in the unit that are not covered elsewhere in school?"

[a]Expected frequencies in parentheses

Chi square = 1.50472, df = 2

Table 21

Data Tabulation for the Chi-square Analysis of a Two-by-three Contingency Table for Hypothesis 3: Student Questionnaire: Item 5

Treatment	Student Response: Yes	Student Response: No	Total
Deciding	42 (39.6667)[a]	7 (9.3333)	49
Life Career Game	39 (39.6667)	10 (9.3333)	49
Combination	38 (39.6667)	11 (9.3333)	49
Total	119	28	147

Note.--Questionnaire Item 5: "Did the unit overall increase your knowledge about making decisions involving important life situations?"

[a]Expected frequencies in parentheses

Chi square = 1.14706, df = 2

Student Questionnaire: Item 6. Table 22 contains the statistical summary of student responses to Item 6. This item asked the question, "Did the unit overall increase your ability to cope with important life situations?" A calculated chi square of 10.50510 was significant at the .01 level. The null hypothesis was rejected.

A significant chi-square value for Item 6 suggested the need for further analysis in order to study what was happening. Additional chi-square tests were performed by regrouping the data into 2 x 2 contingency tables. This procedure permitted a study of the following comparisons: Deciding and Life Career Game, Deciding and combination, and Life Career Game and combination. A significant chi-square value (10.2607, $p < .01$, $df = 1$) was obtained for the analysis between Deciding and combination. Examination of the frequencies of student responses revealed that the research hypothesis was not supported. It appears that students participating in Deciding differ significantly from students participating in the combination treatment in feeling more strongly that their overall ability to cope with important life situations increased.

Student Questionnaire: Item 7. Data pertaining to student response to Item 7 of the student questionnaire are found in Table 23. Item 7 asked the question, "Have you used what you learned in the unit outside of class?" An obtained chi square of 7.87096 was significant at the .05 level. The null hypothesis was rejected. Differences in student attitudes existed in relation to this item. Additional testing was required to determine the nature of this relationship.

Table 22

Data Tabulation for the Chi-square Analysis of a Two-by-three Contingency Table for Hypothesis 3: Student Questionnaire: Item 6

Treatment	Student Response		Total
	Yes	No	
Deciding	43 (36.3333)[a]	6 (12.6667)	49
Life Career Game	37 (36.3333)	12 (12.6667)	49
Combination	29 (36.3333)	20 (12.6667)	49
Total	109	38	147

Note.--Questionnaire Item 6: "Did the unit overall increase your ability to cope with important life situations?"

[a]Expected frequencies in parentheses

Chi square = 10.5051, df = 2, $p < .01$

Table 23

Data Tabulation for the Chi-square Analysis of a Two-by-three Contingency Table for Hypothesis 3: Student Questionnaire: Item 7

Treatment	Student Response		Total
	Yes	No	
Deciding	37 (29.3333)[a]	12 (19.6667)	49
Life Career Game	27 (29.3333)	22 (19.6667)	49
Combination	24 (29.3333)	25 (19.6667)	49
Total	88	59	147

Note.--Questionnaire Item 7: "Have you used what you learned in the unit outside of class?"

[a]Expected frequencies in parentheses

Chi square = 7.87096, df = 2, $p < .05$

Chi-square tests were performed after regrouping the data into 2 x 2 contingency tables. A study was made of the relationships between Deciding and the Life Career Game, Deciding and combination, and Life Career Game and combination. A significant chi-square value (4.50368, $p < .05$, df = 1) was obtained for the Deciding and Life Career Game comparison. For the Deciding and combination analysis a significant chi-square value (7.33806, $p < .01$, df = 1) was also obtained. Examination of the response frequencies revealed that the research hypothesis was not supported. It may tentatively be concluded that students participating in Deciding believe that they are using what they learned in the unit more frequently than students in the other experimental groups. The Life Career Game group falls somewhere in between the Deciding group and the combination group.

A summary of the chi-square values for the seven items of the student questionnaire which was used to test Hypothesis 3 is presented in Table 24.

Hypothesis 4

Hypothesis 4 states that parents of students participating in the combination treatment will perceive this group to be better decision makers than parents of students receiving the other treatments.

To test this hypothesis a 16-item parent rating scale was administered at the beginning and the end of the study. A 3 x 3 contingency table (see Table 5, p. 60) provided the basis for classification of the data that were collected. Tables 25 - 40 present the tabulation of the data for each of the 16 items in the criterion measure.

Table 24

Summary of the Values of Chi Square
for the Seven Items of the
Student Questionnaire
for Hypothesis 3

Item Number	df	Chi Square
1	2	1.57155
2	2	2.09146
3	2	3.50668
4	2	1.50472
5	2	1.14706
6	2	10.50510**
7	2	7.87096*

Chi square (.05, 2, 147) = 5.99147

Chi square (.01, 2, 147) = 9.21034

*p< .05

**p< .01

Table 25

Data Tabulation for the Chi-square Analysis of a Three-by-three Contingency Table for Hypothesis 4: Parent Rating Scale: Item 1

Treatment	Parent Response			Total
	Better	Same	Worse	
Deciding	8 (8.3333)[a]	12 (10)	0 (1.6667)	20
Life Career Game	9 (8.3333)	9 (10)	2 (1.6667)	20
Combination	8 (8.3333)	9 (10)	3 (1.6667)	20
Total	25	30	5	60

Note.--Item 1: "Our teenager knows how to go about getting information he needs in making decisions."

[a]Expected frequencies in parentheses

Table 26

Data Tabulation for the Chi-square Analysis of a Three-by-three Contingency Table for Hypothesis 4: Parent Rating Scale: Item 2

	Parent Response			
Treatment	Better	Same	Worse	Total
Deciding	6 (7)[a]	12 (10.3333)	2 (2.6667)	20
Life Career Game	7 (7)	9 (10.3333)	4 (2.6667)	20
Combination	8 (7)	10 (10.3333)	2 (2.6667)	20
Total	21	31	8	60

Note.--Item 2: "Our teenager is aware of the importance of values in making decisions."

[a]Expected frequencies in parentheses

Table 27

Data Tabulation for the Chi-square Analysis of a Three-by-three Contingency Table for Hypothesis 4: Parent Rating Scale: Item 3

Treatment	Parent Response			Total
	Better	Same	Worse	
Deciding	8 (6.3333)[a]	9 (10.3333)	3 (3.3333)	20
Life Career Game	7 (6.3333)	10 (10.3333)	3 (3.3333)	20
Combination	4 (6.3333)	12 (10.3333)	4 (3.3333)	20
Total	19	31	10	60

Note.--Item 3: "Our teenager uses his own goals, values, and beliefs to establish clear objectives for himself."

[a]Expected frequencies in parentheses

Table 28

Data Tabulation for the Chi-square Analysis of a Three-by-three Contingency Table for Hypothesis 4: Parent Rating Scale: Item 4

Treatment	Parent Response			Total
	Better	Same	Worse	
Deciding	5 (6)[a]	8 (7.6667)	7 (6.3333)	20
Life Career Game	7 (6)	6 (7.6667)	7 (6.3333)	20
Combination	6 (6)	9 (7.6667)	5 (6.3333)	20
Total	18	23	19	60

Note.--Item 4: "Our teenager develops new alternatives or possible actions when the available ones are not satisfactory."

[a]Expected frequencies in parentheses

Table 29

Data Tabulation for the Chi-square Analysis of a Three-by-three Contingency Table for Hypothesis 4: Parent Rating Scale: Item 5

Treatment	Parent Response			Total
	Better	Same	Worse	
Deciding	8 (8)[a]	10 (8.3333)	2 (3.6667)	20
Life Career Game	6 (8)	7 (8.3333)	7 (3.6667)	20
Combination	10 (8)	8 (8.3333)	2 (3.6667)	20
Total	24	25	11	60

Note.--Item 5: "Our teenager ranks various possible outcomes of a decision on the basis of their desirability for him."

[a]Expected frequencies in parentheses

Table 30

Data Tabulation for the Chi-square Analysis of a Three-by-three Contingency Table for Hypothesis 4: Parent Rating Scale: Item 6

Treatment	Parent Response			Total
	Better	Same	Worse	
Deciding	6 (6)[a]	9 (8.6667)	5 (5.3333)	20
Life Career Game	5 (6)	7 (8.6667)	8 (5.3333)	20
Combination	7 (6)	10 (8.6667)	3 (5.3333)	20
Total	18	26	16	60

Note.--Item 6: "Our teenager differentiates between routine and critical decisions."

[a]Expected frequencies in parentheses

Table 31

Data Tabulation for the Chi-square Analysis of a Three-by-three Contingency Table for Hypothesis 4: Parent Rating Scale: Item 7

Treatment	Parent Response			Total
	Better	Same	Worse	
Deciding	13 (10)[a]	6 (8)	1 (2)	20
Life Career Game	8 (10)	10 (8)	2 (2)	20
Combination	9 (10)	8 (8)	3 (2)	20
Total	30	24	6	60

Note.--Item 7: "Our teenager analyzes the special nature of a critical decision including its long-range consequences and the closing off of future opportunities."

[a]Expected frequencies in hypotheses

Table 32

Data Tabulation for the Chi-square Analysis of a Three-by-three Contingency Table for Hypothesis 4: Parent Rating Scale: Item 8

Treatment	Parent Response			Total
	Better	Same	Worse	
Deciding	10 (7.3333)[a]	7 (8.6667)	3 (4)	20
Life Career Game	7 (7.3333)	9 (8.6667)	4 (4)	20
Combination	5 (7.3333)	10 (8.6667)	5 (4)	20
Total	22	26	12	60

Note.--Item 8: "Our teenager uses a strategy for making critical decisions.

[a]Expected frequencies in parentheses

Table 33

Data Tabulation for the Chi-square Analysis of a Three-by-three Contingency Table for Hypothesis 4: Parent Rating Scale: Item 9

Treatment	Parent Response			Total
	Better	Same	Worse	
Deciding	12 (9.6667)[a]	7 (7.6667)	1 (2.6667)	20
Life Career Game	7 (9.6667)	9 (7.6667)	4 (2.6667)	20
Combination	10 (9.6667)	7 (7.6667)	3 (2.6667)	20
Total	29	23	8	60

Note.--Item 9: "Our teenager knows high school graduation requirements and the educational options open to him in life planning."

[a]Expected frequencies in parentheses

Table 34

Data Tabulation for the Chi-square Analysis of a Three-by-three Contingency Table for Hypothesis 4: Parent Rating Scale: Item 10

Treatment	Parent Response			Total
	Better	Same	Worse	
Deciding	11 (7.6667)[a]	6 (8)	3 (4.3333)	20
Life Career Game	6 (7.6667)	10 (8)	4 (4.3333)	20
Combination	6 (7.6667)	8 (8)	6 (4.3333)	20
Total	23	24	13	60

Note.--Item 10: "Our teenager uses his time wisely, alloting adequate time for study, leisure, cultural, and recreational pursuits."

[a]Expected frequencies in parentheses

Table 35

Data Tabulation for the Chi-square Analysis of the Three-by-three Contingency Table for Hypothesis 4: Parent Rating Scale: Item 11

Treatment	Parent Response			Total
	Better	Same	Worse	
Deciding	11 (9)[a]	7 (7.3333)	2 (3.6667)	20
Life Career Game	9 (9)	5 (7.3333)	6 (3.6667)	20
Combination	7 (9)	10 (7.3333)	3 (3.6667)	20
Total	27	22	11	60

Note.--Item 11: "Our teenager can collect and organize information about his abilities, interests, and values which affect his choices of school and career goals."

[a]Expected frequencies in parentheses

Table 36

Data Tabulation for the Chi-square Analysis of the Three-by-three Contingency Table for Hypothesis 4: Parent Rating Scale: Item 12

Treatment	Parent Response			Total
	Better	Same	Worse	
Deciding	11 (7)[a]	5 (7.6667)	4 (5.3333)	20
Life Career Game	5 (7)	9 (7.6667)	6 (5.3333)	20
Combination	5 (7)	9 (7.6667)	6 (5.3333)	20
Total	21	23	16	60

Note.--Item 12: "Our teenager sets short-term goals for himself and then works to achieve them."

[a]Expected frequencies in parentheses

Table 37

Data Tabulation for the Chi-square Analysis of a Three-by-three Contingency Table for Hypothesis 4: Parent Rating Scale: Item 13

Treatment	Parent Response			Total
	Better	Same	Worse	
Deciding	10 (10.6667)[a]	7 (5.3333)	3 (4)	20
Life Career Game	10 (10.6667)	4 (5.3333)	6 (4)	20
Combination	12 (10.6667)	5 (5.3333)	3 (4)	20
Total	32	16	12	60

Note.--Item 13: "Our teenager sets tentative long-range career goals and plans a high school program to help him reach his goals."

[a]Expected frequencies in parentheses

Table 38

Data Tabulation for the Chi-square Analysis of a Three-by-three Contingency Table for Hypothesis 4: Parent Rating Scale: Item 14

Treatment	Parent Response			Total
	Better	Same	Worse	
Deciding	6 (7.3333)[a]	10 (8.6667)	4 (4)	20
Life Career Game	7 (7.3333)	9 (8.6667)	4 (4)	20
Combination	9 (7.3333)	7 (8.6667)	4 (4)	20
Total	22	26	12	60

Note.--Item 14: "Our teenager knows his personal strengths and weaknesses."

[a]Expected frequencies in parentheses

Table 39

Data Tabulation for the Chi-square Analysis of a Three-by-three Contingency Table for Hypothesis 4: Parent Rating Scale: Item 15

Treatment	Parent Response			Total
	Better	Same	Worse	
Deciding	9 (7)[a]	8 (10)	3 (3)	20
Life Career Game	6 (7)	12 (10)	2 (3)	20
Combination	6 (7)	10 (10)	4 (3)	20
Total	21	30	9	60

Note.--Item 15: "Our teenager understands how his personal characteristics can affect the school and work goals he eventually will choose."

[a]Expected frequencies in parentheses

Table 40

Data Tabulation for the Chi-square Analysis of a Three-by-three Contingency Table for Hypothesis 4: Parent Rating Scale: Item 16

Treatment	Parent Response			Total
	Better	Same	Worse	
Deciding	8 (9.3333)[a]	8 (6)	4 (4.6667)	20
Life Career Game	10 (9.3333)	7 (6)	3 (4.6667)	20
Combination	10 (9.3333)	3 (6)	7 (4.6667)	20
Total	28	18	14	60

Note.--Item 16: "Our teenager understands the typical activities of workers in different occupational fields."

[a]Expected frequencies in parentheses

A chi-square test was performed for each item in the parent rating scale. Table 41 contains a summary of the chi-square values that were obtained. None of the values was significant at the .05 level. The null hypothesis was accepted. There were no statistically significant differences among parents' perceptions. It was concluded that parents of students participating in the combination treatment did not perceive them as better decision makers than parents of students involved in the other experimental treatments.

Table 41

Summary of the Values of Chi Square
for the Sixteen Items of the
Parent Rating Scale
for Hypothesis 4

Item Number	df	Chi Square
1	4	3.48000
2	4	1.73733
3	4	2.02003
4	4	1.36308
5	4	6.10545
6	4	3.24679
7	4	3.40000
8	4	2.76573
9	4	3.40817
10	4	4.25084
11	4	4.97980
12	4	5.31988
13	4	2.62500
14	4	1.17483
15	4	2.32381
16	4	4.47619

Chi square (.05, 4, 60) = 9.48773

Chapter 5

Examination of the Results

Chapter 5 contains an examination of the results of the study. The topics included in this chapter are: (a) Summary, (b) Conclusions, and (c) Implications.

Summary

Decision making is practiced by everyone each day of his life, and decision theorists suggest that it is a process which can be learned. To date, however, it has had little or no formal, systematic place in the educational curriculum.

One potentially powerful instructional device for teaching decision-making skills is the simulation game. Games offer a practical approach to decision making, and proponents of game usage assert that students learn more and that the learning is more relevant because the roles students play demand skills that are the same as those demanded by the roles in real life. This relevancy contributes to a unique motivating ability claimed for the games and has led to an increase in the use of simulations in school settings. There has been little in the way of empirical research, however, to support such claims.

The purpose of this study has been to attempt to determine what learning effects, if any, different methods of presenting educational and career information produce in the areas of career attitudes and

decision-making skills. In analyzing these learning effects, two commercially available items, Deciding and the Life Career Game, were utilized. Deciding is a course of study designed to teach junior high school students how to make well-informed and well-considered decisions about themselves, their education, and their future. It uses a lecture-discussion approach to teaching the rationale and principles of making decisions. Three units of work are built around the examination of personal values, the use of relevant information, and the development of effective strategies. The Life Career Game is a simulation activity that attempts to imitate features of the American job, education, and marriage markets. It is designed to give students familiarity with the types of decisions that must be made about jobs, further education, family life, and the use of leisure time.

By utilizing these two approaches to decision making with groups of junior high school students, the following experimental treatments were investigated: (1) Deciding, (2) Life Career Game, and (3) combination of Deciding and the Life Career Game. A control group received no treatment. It was hypothesized that students in the combination group would outperform students in the other groups in the cognitive and affective areas of career decision making. The criterion measure for this aspect of the investigation was the Career Maturity Inventory. A student questionnaire was designed to obtain students' subjective evaluations of the treatment experiences, and it was hypothesized that perceptions of students in the combination group would be different from the perceptions of students in the other groups. Finally, parents were surveyed in an attempt to determine the significance of the learning effects outside of the regular

classroom environment. It was hypothesized that parents of students in the combination treatment would perceive them to be better decision makers than parents of students involved in the other experimental treatments.

In January 1974, two junior high schools in the Chesapeake Public Schools, Chesapeake, Virginia, participated in the study. Four classes enrolled in ninth-grade English at Indian River Junior High School and four classes enrolled in eighth-grade social studies at Great Bridge Junior High School took part in the study. Three experimental treatments and one control treatment were randomly assigned to intact classes in existence with their regularly assigned teacher at each school. The experimental treatments were Deciding, Life Career Game, and a combination of Deciding and the Life Career Game. Involved in the investigation were a total of 210 students and two teachers. The experiment was conducted daily during the regular class session for a period of six weeks.

At the completion of the study two test instruments were administered to the students. The first instrument was the Career Maturity Inventory. The two types of measures which it provides are an Attitude Scale and a Competence Test. The Attitude Scale, consisting of 50 items, is designed to elicit the conative aspects of decision making. The Competence Test, consisting of 100 items, is designed to elicit the cognitive aspects of decision making. The second instrument was a student questionnaire. The 7-item questionnaire was formulated to assess student attitude toward the instructional unit in which he had participated.

A 16-item parent rating scale was developed to assess parent opinion as to whether students were exhibiting improved decision-making skills outside of a regular classroom environment after participating in

the experimental treatments. The scale was solicited at the beginning and at the end of the study. Follow-up instruments were sent out three times in an effort to maximize the number of completed rating scales.

When all data were assembled, scores on the CMI were available for 202 of the original 210 subjects. Criteria scores were not available for eight subjects who were absent during the test periods or had withdrawn from school. The student questionnaire was administered only to the three experimental treatment groups, and questionnaires were received from 151 students. The parent rating scale was administered only to parents of students involved in the three experimental treatments. The response received on the rating scale was low, with only 69 parents completing the instrument at both the beginning and the end of the study.

As an aid in analyzing the data, scores were randomly deleted from the study so that the statistical analysis was conducted on equal cell sizes. Responses from 188 subjects on the CMI, 147 subjects on the student questionnaire, and 60 subjects on the parent rating scale were analyzed.

Hypothesis 1 stated that students participating in the combination treatment will acquire significantly more cognitive decision-making skills, as measured by items on the Competence Test of the CMI, than students participating in the other treatments. Using a posttest only, control-group design, the data were subjected to a one-way classification analysis of covariance to test the hypothesis. The control variables were intelligence and age.

Hypothesis 2 stated that students participating in the combination treatment will have their attitudes, as measured by responses to

the Attitude Scale of the CMI, significantly changed relative to the attitude changes produced by the other treatments. Tests of Hypothesis 2 were conducted according to a single-classification analysis of covariance, controlling for intelligence and age.

Hypothesis 3 stated that students participating in the combination treatment will be significantly different from students receiving the other treatments on student perceptions which were elicited concerning the various methods. The measuring instrument was a 7-item student questionnaire. Tests of Hypothesis 3 were conducted according to a chi-square analysis of a 2 x 3 contingency table of frequencies of student response. One variable consisted of yes-no responses. The three levels of the second variable were Deciding, Life Career Game, and combination.

Hypothesis 4 stated that parents of students participating in the combination treatment will perceive this group to be better decision makers than parents of students receiving the other treatments. To test this hypothesis, a 16-item parent rating scale was administered at the beginning and at the end of the study. A 3 x 3 contingency table provided the basis for classification of the data that were collected. The two variables were parent response and experimental treatments. The three levels of the parent response variable were: better, same, and worse. The three levels of the experimental treatment variable were: Deciding, Life Career Game, and combination. A chi-square test was performed for each item in the parent rating scale.

The .05 level of significance was the standard for all statistical measures. The corresponding confidence levels were .95.

Conclusions

This study was designed to test hypotheses about the relative effectiveness of various methods of teaching decision making. The findings will be reviewed for each hypothesis.

Hypothesis 1

The research hypothesis that students who are taught decision-making skills through a combination treatment will score significantly higher on the Competence Test of the CMI than students taught by other methods was rejected. For Hypothesis 1, the null was accepted. There were no statistically significant differences in cognitive decision-making skills among the four treatment groups. The data revealed a slight trend in the hypothesized direction, indicating that students in the combination group performed somewhat better on the criterion measure than the other groups. This investigation, however, was unable to demonstrate any significant learning differences at the cognitive level.

Hypothesis 2

The research hypothesis that students who are taught decision-making skills through a combination treatment will score significantly higher on the Attitude Scale of the CMI than students taught by other methods was rejected. For Hypothesis 2, the null was accepted. There were no statistically significant differences in attitudes among the four treatment groups. Inspection of the data revealed a very slight trend in the hypothesized direction. Students in the combination group scored slightly higher than students in the other groups. It appears,

however, that the treatment effects on attitude changes were negligible if controlled for intelligence and age. In this study, attitudes seemed to remain fairly constant regardless of the treatment conditions.

Hypothesis 3

For Items 1, 2, 3, 4, and 5 of the student questionnaire, the research hypothesis was rejected. The null was accepted. There were no significant differences in students' perceptions of the various methods with regard to the following questions: Item 1, "Did you like the unit?"; Item 2, "Would you advise your friends to participate in it if they had a choice?"; Item 3, "Was the time you spent worth what you learned from the unit?"; Item 4, "Do you think you covered things in the unit that are not covered elsewhere in school?"; and Item 5, "Did the unit overall increase your knowledge about making decisions involving important life situations?"

There were significant differences among groups for Item 6: "Did the unit overall increase your ability to cope with important life situations?" The null hypothesis was rejected. The difference, however, was not in the hypothesized direction. From the data it appears that students participating in Deciding differ from students participating in the combination treatment in feeling more often that their overall ability to cope with important life situations increased.

Significant differences in student attitudes also existed in relation to Item 7 of the student questionnaire. This item asked the question, "Have you used what you learned in the unit outside of class?" The null hypothesis was rejected. Examination of the data revealed

that the differences were not in the hypothesized direction. It was tentatively concluded that more students participating in Deciding believed that they were using what they learned in the unit outside of class than students in the other experimental groups. The Life Career Game group fell somewhere in between the Deciding group and the combination group.

Hypothesis 4

An analysis of the 16-item parent rating scale did not reveal any statistically significant differences among parents' perceptions of the treatment groups. The null hypothesis was accepted for Hypothesis 4. It was concluded that parents of students participating in the combination treatment did not perceive them as better decision makers than parents of students involved in the other experimental treatments.

Limitations of the Investigation

In conducting an investigation of this nature there are certain inherent limitations which are acknowledged by the investigator as follows:

a. In planning the design for this study, it was necessary to use intact classes. An effort was made to equate the subjects by using homogeneously grouped classes that had been designated by the school system as "average," by assigning treatments on a random basis, and by using analysis of covariance in analyzing the data.

b. Since more than one teacher was involved in the study, an effort was made to minimize this source of variance by using teachers who

volunteered to participate and by conducting training sessions prior to the beginning of the study.

c. The focus in this study was on behavior changes in a select student population that resulted from participating in this one unique educational experience. The investigator was cognizant of the fact that it would not be appropriate to extrapolate the results to all simulations or to all populations.

Implications

The conclusions of this investigation have direct implications to the related research reported in Chapter 2. The fact that there were no significant differences among the four treatment groups supported the conclusion of other studies (Robinson, 1966; Cherryholmes, 1966) that simulation games were not better than other teaching methods with regard to improving cognitive decision-making skills.

In the area of attitudes, the research findings are ambiguous. Some studies (Buchanan, 1972; Clarke, 1970; Lee & O'Leary, 1971; Livingston, 1972) have found that positive attitude changes occurred as a result of participating in a simulation activity. In other studies (Boocock, 1972; Shirts, 1966; Varenhorst, 1972) significant attitude changes did not take place. This investigation seemed to support the findings from the latter group of studies that no significant differences were found among simulation and other teaching methods with respect to attitude changes.

One of the most consistent claims with regard to the value of simulation games in the classroom has been that they are intrinsically motivating and generate interest. Although the evidence supporting this claim has been substantial (Boocock, 1966; Buchanan, 1972; Lee & O'Leary, 1971; Shirts, 1966; Wing, 1966), Fletcher (1969) has indicated that it is unclear whether this effect is caused by anything more than a Hawthorne effect. In this study students were exposed to various methods using new instructional materials. The student questionnaire was designed to obtain students' subjective evaluations of their treatment experiences. The results of this investigation seemed to indicate student preference for new materials which utilized a conventional lecture-discussion approach. This finding would tend to support Fletcher's contention. Other studies (Johnson & Euler, 1972; Livingston, 1972; Robinson et al., Varenhorst, 1972) have also found that students do not perceive simulation games as interesting activities.

Since the use of simulation games in the classroom setting appears to be increasing, it is recommended that future research give some attention to the effective evaluation of game performance. It seems plausible that the measuring instruments that are generally used in simulation studies are geared to the evaluation of conventional classroom procedures. An attempt should be made to discover if the measuring instruments that are being used are assessing the learnings that are taking place or if special instruments should be developed for this purpose.

Retention of learning is another facet of evaluation which merits additional attention. In an effort to have the data reflect the impact of the full educational experience, it may be helpful to wait for a period of time after the experimental treatments before obtaining evaluation data. The objective of such research would be to ascertain the sustained effects of simulation activities on the decision-making abilities of students.

It is also recommended that this study be replicated at the high school level. The Life Career Game is a complex simulation. It is possible that junior high school students do not perceive the relevancy of the concepts that are incorporated in the activity. It would be helpful if a similar assessment were made of learning effects of a combination treatment on older students.

As a result of this study, the Chesapeake Public Schools are planning to offer an elective 9-week mini-course in decision making using a combination of Deciding and the Life Career Game. A unit of study, which has been prepared for the course by a special committee of the social studies department, is included in the Appendix.

One of the important curriculum developments taking place in the schools is the emphasis upon career education. An abundance of resources exist which can be used with groups of students to enrich the study of the world of work and of the vocational choice process. The aim of this research has been to look for approaches which will enable the school counselor to expand his role in the area of career guidance.

Because of the nature of his work, the counselor is in a unique position to participate in the development of innovative methods in this area.

While it is believed that much can be gained by the use of group procedures as a part of career education, this does not replace individual counseling. Even the most extensive use of career information in groups cannot solve an individual's problems as effectively as individual counseling. When properly coordinated, however, individual and group methods can be expected to contribute more than either method alone. Each makes a unique contribution to the individual's development and should be provided for in the school setting.

Appendices

Appendix A

Letter to Parents at the Beginning of the Study

Dear Parents:

A question that we, as educators, often ask ourselves is, "How can teachers and counselors help students to understand the society that they will enter when they leave school and to make intelligent plans for their own future lives?" One implication of such a question is that students need to be expert decision makers. Decision-making skills, however, are rarely included in a formal, systematic manner in the educational curriculum. Special units of study are now available to help students learn and practice rational processes for making decisions. The Guidance Department is making these units available to the Social Studies Department and they will be used during a part of this grading period.

We wish to solicit your help in evaluating the effectiveness of these new materials. It would aid us to know how you rate your teenager's present degree of skill on certain aspects of decision making. The attached rating sheet gives you an opportunity to express your opinion. We would appreciate your completing and returning it to the classroom teacher.

Thank you for your assistance.

THE GUIDANCE DEPARTMENT

Appendix B

Letter to Parents at the Conclusion of the Study

Dear Parents:

Your teenager has just completed a special unit of study in decision making. You will recall that the Guidance Department made these units available to the Social Studies Department for use during a part of this grading period.

We wish to solicit your help in evaluating the effectiveness of these new materials. It would aid us to know how you rate your teenager's present degree of skill on certain aspects of decision making. The attached rating sheet, which is identical to the one you received in January, gives you an opportunity to express your opinion. We would appreciate your completing and returning the rating sheet to the classroom teacher.

By comparing the two ratings, we will be able to ascertain student growth in decision-making skills that has manifested itself outside of the classroom. By combining your ratings with classroom tests, teacher observations, and student opinions, we hope to be able to determine the effectiveness of the unit in increasing the student's knowledge about making decisions and in increasing his ability to cope with important life situations.

Thank you for your assistance.

THE GUIDANCE DEPARTMENT

Appendix C

Decision-making Unit

Department of Social Studies
Chesapeake Public Schools

Title: DECISIONS, DECISIONS
Computer Number: 312
Level of Difficulty: 1
Area of Concentration: Social Studies 8

Course Description:

Get up or go back to sleep; the blue jeans or the green ones; doughnut or cereal; cheat or be honest; a hot dog or a hamburger; a movie or do homework; clean my room or play ball; channel 3 or channel 10; the late movie or an extra hour of sleep--decisions, decisions--every day brings a bountiful supply of new ones. Life often seems to be just one decision after another. Poor decisions can limit one's freedom. Good decisions can make every tomorrow better than today.

This course is designed to help you learn how to make satisfactory decisions. There is increased pressure on students to make choices at an earlier age. Learn how to plan, how to investigate the different possibilities of any choice, how to be a more productive teenager--because you decided to take this course.

Student Objectives:

Upon completion of this course the student will be able to

1. Discuss orally and/or in writing the decision-making process as it relates to man including:

   a. values
   b. objectives
   c. alternatives
   d. types of information
   e. sources of information
   f. strategy
   g. risk
   h. desirability of outcomes
   i. probability of outcomes

2. Define the following terms:

   a. values - the ideas and the things which are very important to a person in coming to a decision

b. objectives - goals; aims; targets; statements of intention indicating what a person would desire
c. risk - hazard, danger
d. strategy - method of achievement; tactics; a plan for converting values, objectives, information and risks into a decision
e. alternative - a choice between two or more possibilities
f. critical - crucial; decisive; i.e. critical decision--one in which the results lead to or prevent something that is important to the decision maker
g. peer - one of equal standing
h. occupation - employment; profession; work
i. leisure - freedom from occupation or work; ease
j. budget - a statement of income and money spent
k. minimum - the smallest amount; the lowest degree
l. trade-school - a school at which a person learns an occupation or handicraft
m. co-educational - men and women attending classes together
n. junior college - a two-year program of study
o. liberal arts - a course of study that consists of general subjects rather than specialized, professional or vocational training
p. verbal ability - capability in use of words, i.e. English, social studies
q. quantitative ability - capability in using numbers and symbols, i.e. math, science
r. vocational ability - capability in manual tasks
s. intuition - supposed power of the mind to grasp a truth without recourse to reason
t. agonize - to suffer; torture; distress
u. fate - destiny; the force believed to determine events; inevitable necessity
v. paralyze - loss of power of action or sensation in a part of the body
w. impulsive - spontaneous; impetuous; unreflecting

3. List and distinguish between the three major requirements of skillful decision making including:

   a. values - ideas and/or things which are important to the decision maker
   b. relevant information - knowledge needed to make a satisfying decision
   c. strategy - the method used to convert values and information into a decision

4. Cite examples of personal decisions that (a) have been made in the past, (b) are being made in the present, and (c) will be made in the future in the following areas:

a. education
b. money
c. work (part-time or full-time)
d. friends
e. family
f. activities (clubs and hobbies)

5. Given specific information concerning a decision to be made, predict:

a. possible alternatives one might take
b. possible outcomes one might encounter
c. probability of outcomes one might consider
d. desirability of outcomes one might desire

6. Given pertinent information (a daily newspaper, V.E.C., periodicals, etc.), identify the inferred values of a group such as those which seem to be common among the majority of Americans as listed in Sociology: The Study of Human Relationships by W. Laverne Thomas and Robert J. Anderson, Harcourt, Brace, Jovanovich, Inc., 1972, pp. 65-67, including:

a. individual endeavor
b. education
c. controlling the natural environment
d. bigness
e. spatial movement
f. change and novelty
g. time
h. technology
i. physical comfort
j. self-improvement

7. Examine himself by:

a. stating his personal values
b. using this statement to list personal objectives
c. distinguish between clearly stated personal objectives and those that are not by answering the questions:
   (1) When should the objective be reached?
   (2) How can one judge when the objective has been reached?
d. gather new data that has been learned about himself

8. Identify the following on a chart after reading a selection which deals with the making of a decision:

a. decision made
b. alternatives

c. kinds of information needed
d. sources of information
e. strategies that might be used
f. risks involved
g. apparent value
h. objective

9. Given a significant historical and/or contemporary excerpt, describe the decision-making process used either in written form or orally.

10. Given specific situations, distinguish between possible acceptable and unacceptable alternatives giving consideration to personal values, family values, and/or values of society and cite reasons for the choice.

11. Explain five of the decision making strategies such as:

a. wish - to desire and not consider risk or probability
b. escape - avoid the worst outcome
c. safe - have a high chance of succeeding
d. combination - use of parts of several strategies
e. impulsive - doing immediately; no forethought
f. fatalistic - let providence decide
g. complaint - let someone else do it
h. delay - to put off
i. agonize - to get excessive data and evaluate every aspect
j. plan - use logical procedure
k. intuitive - inner self (subconscious) decides
l. paralysis - to lose power of action

12. Given a situation in which a decision was made, identify the strategy from the list as stated in objective eleven.

13. Construct a written student profile which includes abilities, grade transcript, hobbies, family background, talents, and personality traits.

14. Prepare a workable hourly, daily schedule for himself including:

a. school time
b. study time
c. chore time
d. recreation time
e. work time
f. eating time

15. Complete information requested on a given job and/or school application.

Materials of Instruction

A. Text

Deciding by H. B. Gelatt, Barbara Varenhorst, and Richard Carey, New York: College Entrance Examination Board, 1972.

B. Reference Materials for the Teacher

1. Professional Periodical

a. Social Education, February, 1974, Vol. 38, No. 2.

2. Books

a. Decisions in American History by George Shaftel, Lexington, Massachusetts: Ginn and Company, 1972.
b. The Americans edited by Stephen W. Sears and others, New York: Holt, Rinehart and Winston, Inc., 1970.
c. We Are Making Decisions by Philmore B. Wass, Lexington, Massachusetts: Ginn and Company, 1972.
d. Sociology: The Study of Human Relationships by W. LaVerne Thomas and Robert J. Anderson, New York: Harcourt, Brace, Jovanovich, Inc., 1972.
e. Selected Case Studies in American History by William E. Gardner, Robert W. Berry, James R. Olson, Kenneth A. Rood, Boston: Allyn and Bacon, Inc., 1970.
f. Decision-Making in a Democracy by James P. Shaver and A. Guy Larkins, Boston: Houghton Mifflin Company, 1973.
g. Values Clarification by Sidney B. Simon and others, New York: Hart Publishing Co.

C. Audio Visuals

1. Films

TMC

a.	2119 - "Boomsville"	11 mins.
b.	0482 - "Primitive Man in a Modern World"	23 mins.
c.	0372 - "It's Your Decision--Part I"	26 mins.
d.	0012 - "It's Your Decision--Part II"	16 mins.
e.	1756 - "A Plain White Envelope"	20 mins.
f.	1056 - "Junior High--A Time of Change"	15 mins.
g.	0335 - "How to Keep What We Have"	12 mins.
h.	0336 - "How to Lose What We Have"	12 mins.
i.	1897 - "Cities of the Future"	25 mins.
j.	0247 - "Theodore Roosevelt"	26 mins.
k.	0585 - "Woodrow Wilson"	26 mins.

l. 0502 - "Herbert Hoover" 26 mins.
m. 0258 - "F. D. R.: Third Term to Pearl Harbor" 27 mins.
n. 0008 - "Harry S. Truman--The Presidency" 26 mins.
o. 0228 - "Eisenhower Years, The" 21 mins.
p. 0460 - "Mark Twain" 30 mins.
q. 0393 - "Joseph Stalin" 26 mins.
r. 0113 - "Fidel Castro" 27 mins.

STATE

s. 83605 - "Am I Dependable" 11 mins.
t. 11404 - "Am I Trustworthy" 10 mins.
u. 34804 - "Are You A Good Citizen" 11 mins.

2. Filmstrips and Records

TMC

a. 5004 - "Values for Teenagers: The Choice it Yours"
b. 5020 - "Dropping Out: Road to Nowhere"
c. 5010 - "If You're Not Going to College"

OTHER

d. "What Are Your Values and Why" - Teaching Resource Films, Bedford Hills, New York, 10507.

e. "The Adolescent Experience: Developing Values" - Guidance Associates

f. "The Adolescent Experience: Setting Goals" - Guidance Associates

g. "Values for Teenagers in the 1970's" - Guidance Associates

h. "Exploring Moral Values" Warren Schloat Productions, Inc.

3. Simulation Games

a. Life Career Game by Western Publishing Company, developed by Sarane B. Boocock.
b. Dilemma 2060 by Helen Finken, P. O. Box 393, Provo, Utah 84601; Stem; Copyright 1973. (Student Education Material, Publication Number 28)

c. What Would You Do If. . .? by William L. Sohn, P. O. Box 393, Provo, Utah 84601; Stem; Copyright 1972. (Student Education Material, Publication Number 13)

Departmental File, Decisions, Decisions

A. Sample Test Items

Objective One

The sample test item is the same as the objective. More advanced students may be asked to discuss in essay form; slower students or the non-reader may be asked to discuss orally in small groups.

Objective Two

The sample test item is the same as the objective.

Objective Three

The sample test item is the same as the objective.

Objective Four

Complete the following chart giving consideration to the things that have been important to you in the past, are important to you now, and which you feel will be important in the future.

MY PERSONAL DECISIONS

	Past	Present	Future
Education			
Money			
Work			
Friends			
Family			
Activities			

Objective Five

The sample test item is the same as the objective.

Objective Six

The sample test item is the same as the objective.

Objective Seven

The sample test item is the same as the objective.

Objective Eight

After reading a selection which deals with the making of a decision, identify the following components of the process:

Decision Made	Alternative	Information Kinds	Information Sources	Strategy	Risks	Apparent Values	Objectives

Objective Nine

The sample test item is the same as the objective.

Objective Ten

The sample test item is the same as the objective.

Objective Eleven

The sample test item is the same as the objective.

Objective Twelve

The sample test item is the same as the objective.

Objective Thirteen

The sample test item is the same as the objective.

Objective Fourteen

The sample test item is the same as the objective.

B. Suggestions to the Teacher

1. Brown bag - Have everyday articles in bag, i.e. paper clips, rubber bands, toothpick, egg carton, pop bottle, etc. Pass around and let each student draw one. Within a given time limit, let him decide on as many uses as he can for the article.

2. Have students acquire an article from the trash can. Decide how it can be made useful or ornamental and follow through on his decision. Bring to class to display.

3. Ask principal, assistant principal, counselor, librarian, or fellow teacher to assist you by taking small groups of students to discuss with them some of their important life decisions. Students will report information to the group at another class session.

4. Have each student interview a person in the community and list decisions that this person has to make every day on the job.

5. Give each student a card indicating a hypothetical situation. Before leaving class, let student write on another card, to be left with you, what decision he would make. Instruct the student to carry the card home, discuss the situation with his family and record the decision of the family. If there is not a unanimous decision, the position of each family member should be recorded. The following day compare first decision by student and final family decision. Discuss values, objectives, alternatives, information, risks, strategy, etc.

   Examples:

   a. Your family received in the mail today a check for $1,000. What will your family do with the money?

   b. Your dad comes in from work this afternoon and informs the family that his plant is closing two weeks from now and he will be out of work.

c. Your mother went to the physician today. He told her that she must enter the hospital next week for major surgery.

Note: (b) and (c) can be done separately or combined for students capable of complex problem solving.

6. Invite resource people representing different occupations to come to the class and discuss with the class the decisions they have to make in their particular occupation. This could be a panel discussion activity.

7. Do a mini-unit on obtaining information from graphs.

8. Collect editorial cartoons, or have students collect or draw them, that illustrate decisions that have been made.

9. Obtain comic strips, i.e. Funky Winkerbean, and have students determine the decisions made by the character.

10. Ask the librarian to pull a classroom set of biographies from the shelves on varied reading levels. Students will choose a book and be allowed class time to read it. Prepare contracts A, B, and C and let students contract for their scores.

Example:

A. "A" contract the student might

(1) read book
(2) analyze 10 decisions made by the character
(3) illustrate character and his major decision

B. "B" contract the student might

(1) read book
(2) chart "x" number of decisions
(3) etc.

11. Allot each student $40. He must feed a family of four for one week. Plan meals and give cost itemization of groceries.

12. Students prepare a one-minute oral biography. This would be a good first-day activity. They must decide what are the most important facts to tell.

13. A bag of self - Bring in old magazines (these may be obtained from post office). Students must cut out pictures which illustrate their decisions, values, objectives, their risk index, and strategies they use most often. This is a good concluding activity. May also be done as a collage.

14. Classmates list things they have learned about each other. Decisions must be made about listing negative and/or positive facts. Number of items may be limited.

15. Have superior come in and "scold" teacher during class for missing faculty meeting or bus duty using statement, "You made a bad decision." Play act the situation. Discuss with group.

16. Select a poem such as "The Road Not Taken" by Robert Frost. Students determine the decision or decisions made.

17. Filmstrip, Ms. America, American Adventures, Series IV, Scholastic, is excellent to discover decisions made by American women. Teaching guide also contains scenarios that are good activity projects.

18. Allot student $1. He must survive in the ghetto for three days. List decisions made and rank decisions in order of importance.

19. Using pictures from magazines, allow students to note decisions which appear to have been made. Add information and see if the opinions of students are altered. Continue activity by letting students get into small groups. Is the decision of the group more conclusive than the individual decision?

20. Films (see Audio Visuals) series j - r--teacher will possibly choose only one or two depending on needs and/or interests of a particular group.

21. Profiles that are written by students (Objective 13) may be redistributed and students requested to plan an instructional course for this student for "x" number of years.

C. *Suggestions for working in small groups*

Working in small groups will be a new experience for some students. At the onset some activities should be used

which will help students learn techniques of group work. Some of these are:

a. "An Experiment in Cooperation"
b. "An Experiment in Communication"
c. "Lost on the Moon: A Decision Making Problem"
d. "The Fishbowl"
e. "Brainstorming"

D. Life Career Simulation suggestions:

1. Prepare wall charts for recording group scores. Groups like the competition.

2. Prepare a chart for each student on which he can record decision(s) made and score for each round. Some students have difficulty remembering what was done previously.

3. Large brown envelopes will be needed for each group to keep schedule forms and record sheets in an orderly manner.

4. Boxes or plastic pans are needed for students to return profile cards, playing rule booklets, catalogues, etc.

Appendix D

Table A: Master Data Sheet for Hypotheses 1 and 2

Treatment[a]	Competence Test Score	Attitude Scale Score	IQ	Age
1	43	31	82	16
1	59	43	103	15
1	45	32	112	13
1	57	32	116	15
1	66	40	107	15
1	68	37	114	14
1	69	33	117	14
1	67	33	119	14
1	78	36	131	15
1	61	38	104	15
1	35	29	106	14
1	66	30	111	14
1	61	41	96	16
1	63	29	96	15
1	65	42	109	15
1	64	35	101	15
1	78	31	104	15
1	77	38	118	14
1	59	34	108	14

[a]Treatment 1 = Control, Treatment 2 = Deciding, Treatment 3 = Life Career Game, Treatment 4 = Combination

Table A (continued)

Treatment[a]	Competence Test Score	Attitude Scale Score	IQ	Age
1	63	33	93	14
1	48	33	97	14
1	70	33	95	14
1	69	30	114	15
1	53	30	96	14
1	34	23	82	14
1	73	35	115	13
1	36	26	94	14
1	44	26	85	15
1	59	30	91	14
1	50	22	78	14
1	26	13	63	15
1	32	18	84	14
1	56	28	91	14
1	72	37	106	14
1	39	29	85	14
1	43	24	71	15
1	46	23	95	13
1	66	36	115	14
1	70	38	113	14

[a]Treatment 1 = Control, Treatment 2 = Deciding, Treatment 3 = Life Career Game, Treatment 4 = Combination

Table A (continued)

Treatment[a]	Competence Test Score	Attitude Scale Score	IQ	Age
1	69	36	118	13
1	76	33	136	13
1	38	39	87	15
1	70	36	127	14
1	68	38	107	14
1	63	37	104	13
1	57	25	89	14
1	28	26	71	14
2	36	36	93	14
2	68	40	108	15
2	45	33	125	15
2	53	31	105	15
2	49	31	98	15
2	68	36	97	15
2	77	38	113	14
2	70	36	88	14
2	63	40	85	15
2	60	36	94	15
2	62	32	113	14
2	76	37	106	14

[a]Treatment 1 = Control, Treatment 2 = Deciding, Treatment 3 = Life Career Game, Treatment 4 = Combination

Table A (continued)

Treatment[a]	Competence Test Score	Attitude Scale Score	IQ	Age
2	26	39	120	15
2	26	23	92	16
2	42	33	95	15
2	62	39	102	15
2	44	30	81	15
2	66	39	114	14
2	53	36	100	15
2	73	34	106	14
2	57	40	86	14
2	66	36	101	15
2	62	33	107	14
2	59	38	111	14
2	42	17	68	15
2	43	28	96	13
2	45	19	77	14
2	54	31	102	13
2	59	40	120	13
2	27	24	66	14
2	59	30	101	14
2	56	26	92	13

[a]Treatment 1 = Control, Treatment 2 = Deciding, Treatment 3 = Life Career Game, Treatment 4 = Combination

Table A (continued)

Treatment[a]	Competence Test Score	Attitude Scale Score	IQ	Age
2	46	28	86	16
2	69	35	96	15
2	32	25	96	13
2	82	32	132	14
2	54	30	92	14
2	43	22	78	14
2	43	38	91	13
2	47	30	84	14
2	58	32	105	14
2	18	20	74	14
2	71	37	105	13
2	42	31	69	16
2	66	34	123	14
2	30	32	63	15
2	53	29	105	14
3	69	32	105	14
3	51	25	102	15
3	72	31	102	15
3	53	36	108	14
3	74	40	117	15

[a]Treatment 1 = Control, Treatment 2 = Deciding, Treatment 3 = Life Career Game, Treatment 4 = Combination

Table A (continued)

Treatment[a]	Competence Test Score	Attitude Scale Score	IQ	Age
3	53	33	75	15
3	65	34	94	15
3	66	36	127	14
3	51	35	99	15
3	67	35	109	14
3	76	33	122	14
3	60	38	86	14
3	63	36	111	15
3	82	36	112	14
3	62	37	82	14
3	78	41	107	14
3	61	38	108	14
3	35	19	65	15
3	58	21	111	14
3	74	31	112	14
3	51	33	100	14
3	61	43	88	18
3	77	37	103	14
3	76	39	135	13
3	34	27	62	15

[a]Treatment 1 = Control, Treatment 2 = Deciding, Treatment 3 = Life Career Game, Treatment 4 = Combination

Table A (continued)

Treatment[a]	Competence Test Score	Attitude Scale Score	IQ	Age
3	54	28	104	14
3	42	30	77	13
3	66	38	121	14
3	58	38	111	14
3	49	28	90	13
3	66	32	87	13
3	64	31	88	14
3	72	37	111	13
3	38	25	81	13
3	64	35	101	14
3	45	26	109	14
3	24	20	69	14
3	63	35	108	13
3	72	36	102	13
3	33	13	75	13
3	47	25	77	13
3	67	28	122	14
3	21	25	75	13
3	29	20	70	13
3	46	26	70	14

[a]Treatment 1 = Control, Treatment 2 = Deciding, Treatment 3 = Life Career Game, Treatment 4 = Combination

Table A (continued)

Treatment[a]	Competence Test Score	Attitude Scale Score	IQ	Age
3	33	31	75	14
3	51	32	98	15
4	55	28	109	14
4	53	27	97	14
4	51	23	91	14
4	47	27	98	14
4	63	19	92	15
4	64	36	99	14
4	73	35	99	15
4	49	32	100	15
4	62	34	86	15
4	59	32	117	16
4	69	41	109	15
4	61	38	100	14
4	50	37	104	14
4	57	33	97	15
4	50	34	91	14
4	59	36	122	15
4	54	37	109	14
4	68	37	116	14
4	51	31	88	15

[a]Treatment 1 = Control, Treatment 2 = Deciding, Treatment 3 = Life Career Game, Treatment 4 = Combination

Table A (continued)

Treatment[a]	Competence Test Score	Attitude Scale Score	IQ	Age
4	58	33	130	14
4	65	29	106	15
4	76	39	109	14
4	57	37	92	15
4	57	32	96	14
4	72	41	119	15
4	61	32	113	15
4	50	30	91	15
4	72	31	109	15
4	49	35	93	13
4	34	26	62	15
4	67	36	111	13
4	33	36	63	14
4	76	46	90	14
4	70	33	112	13
4	24	17	61	14
4	64	38	112	13
4	77	36	130	14
4	84	33	122	14
4	67	40	103	13

[a]Treatment 1 = Control, Treatment 2 = Deciding, Treatment 3 = Life Career Game, Treatment 4 = Combination

Table A (continued)

Treatment[a]	Competence Test Score	Attitude Scale Score	IQ	Age
4	48	35	97	14
4	61	41	115	13
4	44	25	99	14
4	73	41	105	14
4	52	35	78	14
4	76	35	119	13
4	87	39	141	14
4	72	33	129	14

[a]Treatment 1 = Control, Treatment 2 = Deciding, Treatment 3 = Life Career Game, Treatment 4 = Combination

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Abstract

A STRATEGY FOR TEACHING DECISION-MAKING SKILLS UTILIZING SIMULATION TECHNIQUES

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The College of William and Mary in Virginia, 1974
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A recognized function of counseling is to assist individuals in learning how to make good decisions, plans, and choices. A practical approach which has been used in the educational setting to help students learn to make decisions is the simulation game. A review of the research, however, reveals that the simulation method does not enhance decision-making abilities. The purpose of this study was to determine what effects alternative methods of presenting educational and career information produce in the areas of career attitudes and decision-making skills. Two commercially available items, Deciding and the Life Career Game, were utilized in three experimental treatment groups: Deciding, the Life Career Game, and a combination of Deciding and the Life Career Game. A fourth group received no treatment and served as a control. It was hypothesized that students in the combination group would outperform those in the other treatments.

Two junior high schools participated in the study which was designed to investigate the effects of special units on career decision-making skills. Four eighth-grade classes at one school and four ninth-grade classes at the other school participated in the study. Three experimental treatments and one control treatment were randomly assigned to intact classes in existence with their regularly assigned teacher at each school. Involved in the study were a total of 210 students and two teachers.

The experiment was conducted five days a week, during the regular class period, over a period of six weeks. At the completion of the study the Career Maturity Inventory and a student questionnaire were administered to the students. A parent rating scale was administered to parents at the beginning and at the end of the study in an effort to assess their opinions of their teenagers' decision-making skills outside of the classroom environment.

The criterion measure for the two major hypotheses was the Career Maturity Inventory. Using a posttest-only, control-group design, data from the CMI were subjected to an analysis of covariance, controlling for intelligence and age. The hypothesis that students in the combination treatment would acquire more cognitive decision-making skills was rejected. Examination of the means revealed a trend in the hypothesized direction, indicating that students in the combination group performed somewhat better on the criterion measure than the other groups. The

hypothesis that students in the combination treatment would exhibit attitudes that were more vocationally mature than the other groups was rejected. Examination of the means revealed a very slight trend in the hypothesized direction, indicating that students in the combination treatment scored slightly above students in the other groups.

Chi square was used to analyze each item on a seven-item student questionnaire and a sixteen-item parent rating scale. Only two items were statistically significant. Students participating in the Deciding group were significantly different from the other groups in feeling that their overall ability to cope with important life situations increased and that they were using what they learned in the unit more frequently.