INFORMATION TO USERS

This reproduction was made from a copy of a document sent to us for microfilming. While the most advanced technology has been used to photograph and reproduce this document, the quality of the reproduction is heavily dependent upon the quality of the material submitted.

The following explanation of techniques is provided to help clarify markings or notations which may appear on this reproduction.

1. The sign or "target" for pages apparently lacking from the document photographed is "Missing Page(s)". If it was possible to obtain the missing page(s) or section, they are spliced into the film along with adjacent pages. This may have necessitated cutting through an image and duplicating adjacent pages to assure complete continuity.

2. When an image on the film is obliterated with a round black mark, it is an indication of either blurred copy because of movement during exposure, duplicate copy, or copyrighted materials that should not have been filmed. For blurred pages, a good image of the page can be found in the adjacent frame. If copyrighted materials were deleted, a target note will appear listing the pages in the adjacent frame.

3. When a map, drawing or chart, etc., is part of the material being photographed, a definite method of "sectioning" the material has been followed. It is customary to begin filming at the upper left hand corner of a large sheet and to continue from left to right in equal sections with small overlaps. If necessary, sectioning is continued again—beginning below the first row and continuing on until complete.

4. For illustrations that cannot be satisfactorily reproduced by xerographic means, photographic prints can be purchased at additional cost and inserted into your xerographic copy. These prints are available upon request from the Dissertations Customer Services Department.

5. Some pages in any document may have indistinct print. In all cases the best available copy has been filmed.

University Microfilms International
300 N. Zeeb Road
Ann Arbor, MI 48106

Vidaurri, Mary Rose Stewart

A QUANTITATIVE METHOD FOR DETERMINING CURRICULUM GOALS IN NURSE ANESTHESIA EDUCATIONAL PROGRAMS

Wayne State University PH.D. 1984

A QUANTITATIVE METHOD FOR DETERMINING CURRICULUM GOALS IN NURSE ANESTHESIA EDUCATIONAL PROGRAMS

by

MARY R. STEWART VIDAURRI

DISSERTATION

Submitted to the Graduate School
of Wayne State University,
Detroit, Michigan

in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

1984

MAJOR: EDUCATIONAL EVALUATION AND RESEARCH

Approved by:

Donald C. Manoogian 3/29/84
Advisor date

Joseph Z Losco

Marilyn H. Oermann

Wendell W. Hough

Acknowledgements

Completion of this educational endeavor was accomplished with the support and encouragement of many people. I would like to acknowledge those individuals who enabled me to achieve this goal:

The members of my dissertation committee including: Dr. Marcotte as chairman, Dr. Hough, Dr. Oermann, and Dr. Posch, Jr. for supporting my educational interests; and Dr. Oermann, additionally, for providing editorial guidance.

My colleagues on the administrative faculty of the Henry Ford Hospital/University of Detroit Program of Nurse Anesthesia, Nancy Dombrowski and David Stasiak, for their support and patience.

My secretary, Rosemary Loersch, for her support and for typing this manuscript against all odds.

The administration of Henry Ford Hospital for its support of this research as well as my pursuit of a doctoral degree.

Two friends I met in this program, June Cline and Dr. Gary Clor, for their support and encouragement.

Two very special people, my parents Dorothy and James Stewart; for their love, confidence, and encouragement.

And foremost, my husband Jesse Vidaurri; for his love, patience, understanding, and support.

Table of Contents

Table of Contents Continued

List of Tables

Chapter 1

Introduction

This chapter provides an overview of the research. A statement of the research problem is presented, and the background of the problem is described leading to the purpose of the study. An introduction to the underlying theoretical framework is provided, and the significance of the study is explained. Assumptions and limitations of the study are identified as well as the definition of terms and the research questions.

Statement of the Research Problem

Evaluation has become an extremely important aspect of educational programs. Many educators, in a variety of disciplines, have utilized techniques based on the discrepancy evaluation model in an effort to implement educational evaluation. By identifying discrepancies between standards and performances, this evaluation technique has been shown to supply quantitative data which identifies areas needing change within a program (Provus, 1971).

The Council on Accreditation of Nurse Anesthesia Educational Programs/Schools (hereafter also referred to as the Council on Accreditation or Council), which is an accrediting body recognized by the United States Department of Education, identifies academic curriculum requirements with which all nurse anesthesia programs must comply. This Council has stated that in 1987 a baccalaureate degree will be required for entry into any generic nurse anesthesia

program. Although the Council has increased the minimum academic requirements of students who will be entering anesthesia programs in the future, it has not changed the required academic curriculum to be offered in these programs. Program directors may perceive that specific educational goals are important and should be met in the future, however, they may not perceive these goals as being met under the current academic requirements of the Council.

The research problem this study investigated is: First, is there a discrepancy perceived between goals that are currently met by the minimum academic requirements of the Council and the importance of goals being met in the future when a baccalaureate degree is required as an entry requirement for all nurse anesthesia programs? Second, can the employment of a discrepancy evaluation technique supply a quantitative data base to assist decision makers in developing future academic curriculum requirements in nurse anesthesia educational programs?

Background of the Problem

Program evaluation serves many purposes ranging from contributing to decisions about program installation to obtaining evidence in opposition to a program. Educational programs that have been in existence for any length of time need periodic monitoring to assess the continuation of program effectiveness and whether the needs the program was designed to serve still exist. Information that is obtained through the evaluation process provides program directors,

instructors, and other involved decision makers with feedback that enables them to make adjustments in the program based on a sound knowledge base. In this capacity educational evaluation serves as a quality control mechanism which enhances program accountability (Anderson & Ball, 1978).

The development of educational standards for schools of nurse anesthesia was a primary objective of the National Association of Nurse Anesthetists (N.A.N.A.) when it was formed in 1931. Between 1933 and 1940 the Association explored the mechanics for conducting a program evaluation of these schools. Evaluations were based on the minimum criteria for acceptance of candidates to take the qualifying examination. Successful completion of this national qualifying examination became an established requirement for membership into the professional association, which had changed its name to the American Association of Nurse Anesthetists (A.A.N.A.) in 1939.

In 1952 the accreditation program was initiated and was endorsed by the American Hospital Association, and in 1955 the American Association of Nurse Anesthetists was listed on the United States Commissioner of Education's list of nationally recognized accrediting agencies. As a result of major revisions in the United States Office of Education's criteria for recognized accrediting agencies, the American Association of Nurse Anesthetists transferred their recognition to the Council on Accreditation of Nurse Anesthesia

Educational Programs/Schools. The Council was formed in 1975 as a semi-autonomous body representing the nurse anesthesia community of interest, including the public, and designated to be independent in decision making with its primary responsibility being to the public. In 1978, after proving its effectiveness, the Council received full operational and functional autonomy while remaining under the corporate structure of the American Association of Nurse Anesthetists (Council on Accreditation, 1980).

The purposes of the Council are to advise, formulate and adopt standards, guidelines, and criteria for the accreditation of nurse anesthesia educational programs and to accredit these programs (Council on Accreditation, 1983). Accreditation decisions are based on the program's compliance with the standards and guidelines of the Council. These standards, developed by the Council with input from program directors, faculty, and the A.A.N.A. Education Committee include:

1. Administrative Policies and Procedures
2. Curriculum and Instruction
3. Records
4. Faculty
5. Administrative Support
6. Program Self-Evaluation
7. Program Enrichment and Innovation
8. Ethics

Currently, within the criteria of Standard II - Curriculum and Instruction, the Council on Accreditation (1980) specifies the following academic curriculum requirements for nurse anesthesia educational programs:

A. Professional Aspects of Nurse Anesthesia
   1. Department management and organization
   2. Ethics
   3. History of anesthesia
   4. Legal aspects of anesthesia
   5. Professional Adjustments (To include local, state, national organizational structure and current issues)
   6. Psychology

B. Anatomy, physiology and pathophysiology in relation to anesthesia
   1. Cell physiology
   2. Nervous system
   3. Respiratory system
   4. Circulatory system
   5. Endocrine system
   6. Excretory system

C. Chemistry and physics in relation to anesthesia

D. Pharmacology in relation to anesthesia

E. Principles of Anesthesia Practice: Basic and Advanced

F. Journal Club, Seminars, Morbidity and Mortality Conferences and/or other Clinical Correlative Conferences (p. 16)

Today there are 137 generic nurse anesthesia educational programs in the United States. The Council on Accreditation, according to its standards and guidelines, utilizes one set of criteria to evaluate all generic programs regardless of whether they are offered in a certificate, baccalaureate, or masters framework. Within these standards the Council requires that students admitted into any generic program must meet the following minimum criteria:

1. Current licensure as a registered professional nurse.
2. A minimum of one year nursing experience in an acute care patient setting.
3. A baccalaureate degree in nursing; or an associate degree plus 30 semester hours; or a diploma in nursing plus 30 semester hours.

In July 1982, the Council ruled that by 1987 registered nurses entering any generic nurse anesthesia educational program must hold a baccalaureate degree. With this increase in academic preparation of future students entering nurse anesthesia programs, it followed that educational goals of the required academic curriculum should be evaluated to ascertain if there is a need to revise the requirements.

The main purpose of this study was to determine whether certified registered nurse anesthetist program directors perceive a need for change in the current minimum academic curriculum requirements. This study investigated educational goals that can be met when a curriculum is based on these academic requirements, as well as the importance of goals being met in the future, when students enter all nurse anesthesia programs with a baccalaureate degree. Any discrepancy perceived between the obtainability of a goal by the current academic requirements and the importance of that goal in the future indicates a need for change in the requirements.

Many programs also incorporate enrichment areas within their curriculum which exceed these academic requirements. If goals currently met by curriculum enrichment areas were perceived by program directors as important goals for the future, then the academic requirements of the Council may need to be changed to reflect curriculum content for achieving these goals.

Theoretical Framework

The theoretical framework on which this study was based considers education a dynamic process consisting of three main components: inputs, processes, and outputs or benefits. Newell (1966) identified the relationship of these components as the "rational partition". He explained that observations are divided, or partitioned, into the three categories of inputs, processes and outputs. In his definition of these categories, inputs include all things that enter the processes; processes are the interactions that operate on the inputs, and outputs are what emerge from the processes. Two restrictions apply to the definition and choice of category that may be selected as a partition: data elements must be exclusively in one of the three categories, and a coherence hypothesis must be formulated which relates particular inputs to particular processes and outputs.

Provus (1971) identified students, teachers, and materials as inputs which interact in a manner that produces particular student competencies. The matter of interaction

that occurs is the process component, and the student competence that is achieved is the output or benefit. Theoretically, the output can be viewed as a function of the interaction of inputs with the process and can be represented by the equation: i (p) = o. Education in the nursing specialty of anesthesia clearly reflects this theoretical concept. Students enter the educational program with certain knowledge, skills, and beliefs and are expected to have changed when they complete the process or educational program (Torres, 1974).

Provus (1971) stated that it is important to recognize that any educational program inevitably changes, and in time the program design and implementation must reflect the same level of change in all three components. In nurse anesthesia educational programs the input component, student knowledge, will be changed in the future, therefore, the process and output components also require evaluation for identification of areas needing change. Identification of important educational goals for the future, as well as identifying discrepancies between what is currently required and what is important in the future, will assist decision makers and nurse anesthesia educators in developing a curriculum that will change the educational process and desired outcomes or goals in proportion to the change in the input level of future students.

Significance of the Study

The results of this study will be of value to all

individuals who are concerned with nurse anesthesia educational programs. The Council on Accreditation of Nurse Anesthesia Educational Programs/Schools is provided with evaluative data from directors of the educational programs it accredits. These data will inform the Council of the educational goals program directors perceive to be important for the future and thus reflect academic curriculum content that will be considered important. In addition, the results from this study provide a knowledge base upon which decisions can be made regarding changes in the Council's curriculum requirements identified in the Standards and Guidelines.

The Education Committee of the American Association of Nurse Anesthetists can utilize the results of this study in two primary ways. First, as indicated by the Policies and Procedures of the Council (Council on Accreditation, 1983), the Education Committee plays a key role in the procedure for revision of the Standards and Guidelines. In the case of major revisions, the Council requests the Education Committee to initiate the process by entertaining recommendations and suggestions for revision. Minor revisions in the Standards and Guidelines are defined as those changes which affect less than 10 to 15% of the specifics within them. A specific example of such a change identified in the procedure for minor revisions is: "The addition, deletion or change in number of required hours relative to a course of study within the program." (Council on Accreditation, 1983, p. 15). It is the Education Committee of the

American Association of Nurse Anesthetists that is responsible for developing a draft of proposed changes in the Standards and Guidelines. Through the results of this study, data are provided regarding certified registered nurse anesthetist program director's perceptions of needed changes in the educational goals met by the academic curriculum requirements within the Standards and Guidelines.

Second, the Education Committee can utilize the results of this study as a basis for planning educational workshops and Assembly of School Faculty programs. Areas of curriculum content may be perceived by program directors as important, however, faculty members currently involved in nurse anesthesia educational programs may have little or no knowledge in these areas. Therefore, in an effort to prepare faculty for future changes in curriculum, workshops can be developed to meet their needs.

On the individual program level, the results of this study demonstrate to program directors what their colleagues perceive as important curriculum goals. This knowledge may act as an incentive or stimulus to improve the curriculum within their own programs prior to future changes in the minimum curriculum requirements.

Assumptions and Limitations of the Study

For the purpose of this study, it is assumed that:

1. Program directors rate current goal obtainability based on their perception of the minimum academic curriculum requirements of the Council and not

based on goals obtainable within their own programs.

2. Program directors rate the importance of goals in the future based on their perception of the importance of these goals being met in a generic nurse anesthesia program when all students enter with a baccalaureate degree.
3. A high rating of importance of any goal is an indication that content should be included as a minimum requirement in the curriculum of nurse anesthesia programs to meet this goal.
4. A discrepancy between current goal obtainability and the importance of that goal indicates a need for change in the Council's current minimum academic curriculum requirements for nurse anesthesia programs.

The limitations of this study are:

1. The results of this study are limited by the actual number of respondents.
2. The results of this study apply to certified registered nurse anesthetist program directors and do not include the perceptions of other faculty, practitioners or other members of the community of interest.
3. The results of this study do not identify those programs which have a curriculum that exceeds the Council's minimum requirements, and

therefore, currently meet specific goals that are not obtainable with the minimum academic requirements.

4. The respondents utilize a rating scale to respond, so their rating may be biased due to personal bias or logical errors.
5. The results of this study are limited to the particular goal statements included in the data gathering instrument utilized in this study.

Definition of Terms

The following definitions have been developed for the purpose of this study.

Generic Nurse Anesthesia Educational Programs. Programs that are a minimum of twenty-four months in length, are accredited by the Council, and prepare students for entry into practice as certified registered nurse anesthetists (C.R.N.A.'s).

Masters Level Nurse Anesthesia Programs. Those generic nurse anesthesia programs that grant a mandatory or optional masters degree.

Baccalaureate Level Nurse Anesthesia Programs. Those generic nurse anesthesia programs that grant a mandatory or optional baccalaureate degree.

Certificate Level Nurse Anesthesia Programs. Those generic nurse anesthesia programs that grant a certificate only.

Certified Registered Nurse Anesthetist (C.R.N.A.) Program Directors. Those certified registered nurse anesthetists designated by title as program director or co-director and/or those certified registered nurse anesthetists who by position and responsibility are actively involved in the organization and administration of the total program.

Minimum Academic Curriculum Requirements. The academic curriculum requirements specified in the 1980 Standards and Guidelines of the Council on Accreditation of Nurse Anesthesia Educational Programs/Schools for generic nurse anesthesia educational programs.

Goal. Statement of ultimate student outcome phrased in general or global terms.

Present Goal Obtainability. Extent which C.R.N.A. program directors believe a specific goal is met by the minimum academic requirements of the Council's minimum academic requirements.

Future Importance of Goal. Extent which respondents believe the goal should be met in a generic nurse anesthesia program when students enter all programs with a baccalaureate degree (1987).

A Need for Change in the Minimum Academic Curriculum Requirements. Reflection of a discrepancy between the rating of present goal obtainability with minimum academic requirements and the rating of the future importance of that goal.

Research Questions

The research questions for this study are as follows:

Research Question I. Is there a discrepancy perceived by C.R.N.A. program directors on the level of goal obtainability with the current minimum academic requirements of generic nurse anesthesia program and the importance of those goals at the time students enter all nurse anesthesia programs holding a baccalaureate degree?

Research Question II. Is there a significant difference between the perceptions of C.R.N.A. program directors of certificate programs, baccalaureate level programs, and masters level programs regarding the level of goal obtainability with the current minimum academic requirements of generic nurse anesthesia programs?

Research Question III. Is there a significant difference between the perceptions of C.R.N.A. program directors of certificate programs, baccalaureate level programs, and masters level programs regarding the importance of goals at the time students enter all nurse anesthesia programs holding a baccaluareate degree?

Research Question IV. Is there a significant difference between the perceptions of C.R.N.A. program directors of certificate programs, baccalaureate level programs, and masters level programs regarding the discrepancy between the level of goal obtainability with the current minimum academic requirements of generic nurse anesthesia programs and the importance of those goals at the time students enter all

nurse anesthesia programs holding a baccalaureate degree?

Research Question V. Are there significant correlations between the perceptions of C.R.N.A. program directors of certificate programs, baccalaureate level programs, and masters level programs regarding the level of goal obtainability with the current minimum academic requirements of generic nurse anesthesia programs?

Research Question VI. Are there significant correlations between the perceptions of C.R.N.A. program directors of certificate programs, baccalaureate level programs, and masters level programs regarding the importance of goals at the time students enter all nurse anesthesia programs holding a baccalaureate degree?

Research Question VII. Are there significant correlations between the perceptions of C.R.N.A. program directors of certificate programs, baccalaureate level programs, and masters level programs regarding the discrepancy between the level of goal obtainability with the current minimum academic requirements of generic nurse anesthesia programs and the importance of those goals at the time students enter all nurse anesthesia programs holding a baccalaureate degree?

Research Question VIII. Is the technique of discrepancy evaluation a feasible method to evaluate an educational curriculum?

Summary

This descriptive research study was conducted as a needs assessment to provide a data base of quantitative

information regarding educational goals for nurse anesthesia. The data provided reflects the perceptions of C.R.N.A. program directors regarding educational goals that are met by the current minimum academic requirements and those goals that are important to be met in the future when students enter all nurse anesthesia programs with a baccalaureate degree. The results of this study identify areas needing change within the minimum academic requirements for nurse anesthesia educational programs.

Chapter 2

Review of the Literature

The literature review is divided into the following sections: (a) the impetus for educational evaluation, (b) the discrepancy evaluation model, (c) educational program evaluations based on the discrepancy model, and (d) the evaluation history of curriculum standards in nurse anesthesia education.

The Impetus for Educational Evaluation

The Elementary and Secondary Education Act (E.S.E.A.) of 1965 provided a major stimulus for program evaluation in education. The E.S.E.A. was enacted to strengthen and improve the quality of education as well as educational opportunities in the nation's elementary and secondary schools. Through this act grants became available for program development, materials, and research in education.

The E.S.E.A. mandates that grant recipients evaluate the effectiveness of programs being funded, and as a result of this provision the National Council on Quality in Education was established. The functions of this National Council include: (a) assessing the educational needs and goals of the nation, (b) conducting objective program evaluations to assure needs and goals are effectively met, and (c) conducting national conferences on the assessment and improvement of education. An additional provision in this act also requires that programs be evaluated by a State Advisory Council on an annual basis to assess effectiveness and

disseminate results of these evaluations (U.S. Congress, 1965).

This emphasis on accountability and program evaluation also occurred in various state legislatures. A number of states passed laws making teachers and other school personnel accountable for the learning and development of students. Although these educational accountability laws vary from state to state, they typically include provisions for specifying and evaluating the outcomes of the programs. The following brief exerpt from the California Stull Act (Statutes of California, 1971), passed in 1971 and put into effect in the fall of 1972, illustrates the nature of such accountability requirements:

> 13487. The governing board of each school district shall develop and adopt specific evaluation and assessment guidelines which shall include but shall not be limited in content to the following elements:
> (a) The establishment of standards of expected student progress in each area of study and of techniques for the assessment of that progress.
> (b) Assessment of certificated personnel competence as it relates to the established standards.
> (c) Assessment of other duties normally required to be performed by certificated employees as an adjunct to their regular assignments.
> (d) The establishment of procedures and techniques for ascertaining that the certificated employee is maintaining proper control and is preserving a suitable learning environment. (p. 727)

Along with state and federal legislation that mandated evaluation in educational programs, the accreditation movement, through the development of formal accreditation policies and procedures, has also had a major impact on educational evaluation. The early accrediting agencies primarily

"policied" institutions that were of dubious quality and did not meet minimum standards. Today, in a more positive role, these agencies help institutions assess their own strengths and weaknesses. Through this self-evaluation process programs are encouraged to improve in light of their own goals (Anderson, Ball & Murphy, 1977).

As a result of these external stimuli, educational programs at the elementary, secondary, and postsecondary levels have placed a major emphasis on evaluation of the teaching-learning process as well as the student's ability to effectively achieve program outcomes. Stufflebeam (1977) identified that the purpose of evaluation is to improve the educational process. If program evaluation is viewed and implemented in a constructive manner, this purpose can definitely be achieved.

The Discrepancy Evaluation Model

Anderson et al. (1977) described discrepancy evaluation as an evaluation method which seeks to identify the difference between two or more variables of an educational program that, according to logical, rational criteria, should be in agreement. This application of discrepancy evaluation, also known as needs assessment, is the evaluation of discrepancies between an existing situation and a desired situation. Utilized as a program evaluation model, this technique is useful in providing the stimulus for development of new or improved educational programs.

The development of the discrepancy evaluation model

began in 1966 when the United States Office of Education received two grants aimed at development and validation of an evaluation model for practitioners in public schools. Provus (1971) is the evaluation researcher recognized as the developer of the discrepancy evaluation model. As a participant in the "Big City Title I Evaluation Conference" which was supported by the Office of Education grants, he and others recognized that in order to have staff commitment to conduct the programs as intended, the standards for evaluation would have to be the staff's definition of a program rather than the evaluator's definition. The importance of self-reliance in educational development was also recognized by Sarason (1971). He acknowledged that changes imposed from above, without input from those who are to implement the changes, are often unsuccessful.

The basic tenets of the discrepancy evaluation model, as described by Steinmetz (1976) include the concepts of standard, performance and discrepancy. A standard is a description of how something "should be". It is a representation of the qualities or characteristics the object should possess. After standards have been set the program evaluator can then measure actual performance and compare performance against standard. This comparison will yield discrepancy information which can be utilized to make judgements about the worth of adequacy of the object being evaluated. Although these concepts underlie the making of any judgements of adequacy or worth, any cybernetic process, and much of

human behavior; the critical factor that distinguishes the discrepancy evaluation model is the manner in which these concepts are applied. The evaluator's primary role is to facilitate the evaluation process by assisting the client to identify standards, and then judge the comparisons made between actual performance and those standards. Through the use of the discrepancy evaluation model, those individuals involved in the process do not merely accept or reject a judgement, they expand their awareness of the components involved in making the decision as well as being a party to the making of that decision (Steinmetz, 1976).

Provus (1971) defined program evaluation as the process of:

> (1) defining program standards; (2) determining whether a discrepancy exists between some aspect of program performance and the standards governing that aspect of the program; and (3) using discrepancy information either to change performance or to change program standards. (p.

The discrepancy evaluation model, designed to implement this process, contains five stages. In the first stage, design, the program's design is identified by examining the theoretical and structural aspects of the program and comparing them with the design criteria. Theory is usually examined by an outside evaluator to determine if the design is theoretically sound, and the structure is then compared with the design criteria thereby formulating the standards. Inputs, processes, and outputs, the components of the program design criteria, are classified as: (a) preconditions

which do not change, (b) variables which are defined as anything that is expected to change as a result of the program, and (c) criteria which specify values of the variables and preconditions. The completion of the design stage results in the establishment of standards to be utilized in the subsequent stages.

In stage two, installation, program performance is compared with the standards of the input and process components. On the basis of any discrepancy information obtained, adjustments are made so that program implementation is equivalent to program design.

In the third stage the relationship between the inputs, also known as the process, and the degree to which interim products are achieved are compared. The hypothesized relationship of inputs identified in the program design is utilized as the standard against which actual interim products are compared. The discrepancy information obtained is used to either redefine the process in the program design or to improve the actual process to meet that defined in the program design.

Stage four, the product stage, measures the outcomes against the standards, which are those outcomes defined in the program design. Thus, both the process and product stage actually measure outcomes by measuring interim goals and terminal goals.

In the fifth and final stage, cost, the actual cost of the program being evaluated is compared to the cost of other

programs which yield the same product. Any discrepancy information may be utilized by decision makers to alter or terminate the program.

During the first three stages, design, installation, and process, the evaluation activities are aimed at program development. The last two stages, product and cost, are aimed at assessing the program. The consistent activity throughout all of these stages involved in total evaluation of a program is the comparison of actual performance to a standard. Any time a discrepancy is identified between the standard and actual performance, a need for change in either the standard or the performance is indicated. When these changes are carried out, the program evaluation process has met the three major purposes identified by Provus (1971): (a) ensure equality of the product, (b) ensure quality of minimal cost, and (c) assist decision makers regarding what should be produced and how. In any type of educational program "quality control requires the establishment of procedures to monitor and modify programs to ensure uniform products that meet acceptable standards" (Provus, 1971, p.

As a needs assessment the discrepancy evaluation model assists decision makers in education to facilitate planning and evaluation of educational programs. Successfully implemented, a needs assessment should be a goal setting process that makes the educational program more accountable to its constituents. Anderson et al. (1977) explained that the extent of discrepancy may be either objectively or

subjectively measured. Objectively, a level of measured performance is compared with the level that is judged acceptable. Subjectively, selected judges are asked to indicate the extent to which needs exist. A distinction between the two may be difficult because the value judgement is necessary for either type of assessment. In addition, it is possible to have a needs assessment consist of a combination of "objective" and "subjective" measures.

Once the approach to measurement has been selected and implemented, the next important step is to prioritize the needs. Anderson et al. (1977) identified several factors that affect decisions about need priorities. First, the level of judged importance of the goal will affect the priority of the need. If a discrepancy is found with a goal that is judged high-importance, that goal will have priority over a goal with a discrepancy that is judged low-importance. Second, the number or specific group of persons demonstrating a need may be taken into consideration. The decision makers will need to determine whether to deal with intense needs demonstrated by few or less-intense needs that are identified by many respondents. And third, is the feasibility of initiating changes to eliminate the need. If the need is judged of high-importance by many respondents, but the decision makers cannot see a ready way to solve it, it may be assigned a lower priority than a less vital need which has a ready solution.

The term "curriculum evaluation" is widely used in

conjunction with textbooks and other curriculum materials utilized for national dissemination to educational programs (Anderson et al., 1977). Rose and Nyre (1977), however, stated that when the term is used in the postsecondary setting it usually is in reference to all courses offered in a particular institution, department, field, or an individual student's course of study. Because it is essential that the curriculum be updated and revised, it must be periodically evaluated; and if changes occur, subsequent evaluation should take place to assess their effectiveness. If the evaluation designed does not look at the curriculum in terms of the program's long-range goals, the response may take the form of merely cosmetic changes and/or defense of the status quo.

The curriculum evaluation in a program should include a determination of the worth, relevance, and interrelationships of goals as well as the attainment of those goals. This can best be achieved if the evaluation is conducted and perceived as a cooperative, collaborative venture with its goal being improvement in the educational program (Rose & Nyre, 1977).

In the area of curriculum content, Weller, Ahnell and Reynolds (1983) identified that a need exists for a data based, quantitative method to guide curriculum developers in selection and implementation of instructional programs that specifically meet the goals and objectives of the schools. They concluded that the use of a discrepancy analysis

technique places curriculum planning and decision making on a sophisticated level, as well as ensuring a greater degree of accuracy regarding agreement on the importance of curriculum content.

In the face of external pressures for accountability, which is an important stimuli for change in education, it is essential to recognize that effective change is dependent upon the concerted efforts of those individuals within the educational setting (Rotem & Baudaranayake, 1981). Cognizant of the budgetary restraints and popular mandates for accountability, McIntyre (1979) pointed out that the discrepancy evaluation method provides curriculum planners with a data based index for curriculum revitalization that is not based on arbitrary decisions. Data for the evaluation process is based on value judgements which can be obtained through the use of an opinion survey. The evaluation then represents a systematic description of various aspects of a program, such as its goals or objectives (Taba, 1962). After collecting and analyzing the data, the curriculum planners will have a knowledge of what content should be emphasized in the curriculum (Weller et al., 1983).

Although the discrepancy evaluation model has been proven to be extremely useful in the area of educational evaluation, it is important to be cognizant of difficulties associated with the perception of discrepancies. Perceptions may vary from individual to individual and from situation to situation. Steinmetz (1976) has identified several

factors which may hinder the perception of discrepancies in education. If educational goals are intangible or ambiguous, it may be difficult to perceive discrepancies. In addition, many important educational outcomes are manifest in the future which makes evaluation of these goals feasible only after a lengthy period of time. Another factor which may affect discrepancy evaluation is the pluralistic nature of our society. The different value systems that exist may hinder the perception of a discrepancy between the outcomes and society's expectations. And finally, educators themselves may hinder the process of perceiving discrepancies if they are reluctant to exchange perceptions of performance or if they are unwilling to take the time and effort necessary to carry out a worthwhile discrepancy evaluation.

Educational Program Evaluation Based on the Discrepancy Model

Davis (1974) described a two year project to develop and implement an evaluation process for programs of the National Center for the Improvement of Educational Systems (N.C.I.E.S.) of the United States Office of Education. Questionnaires utilized as data gathering instruments were pilot-tested in eighty programs within eight N.C.I.E.S. programs nationwide. The study included 438 projects in twelve N.C.I.E.S. programs.

Program managers established goals for each program against which to gauge actual program performance. Statistical results were obtained by comparing actual performance

against planned performance. Discrepancy analysis data identified those programs that did not equal or exceed the established program goals, and therefore, assisted decision makers in identifying areas needing improvement. In addition, data also identified those programs that were successful in meeting the established goals.

Effarah (1977) utilized discrepancy analysis to evaluate the impact of electronic data processing on business education in the secondary schools of Oregon. The study, which answered a total of twenty-one research questions, utilized a questionnaire survey on which respondents rated their opinions regarding what was currently taught and what should be taught in secondary school business curriculums on the topic of electronic data processing (E.D.P.). Respondents were asked to rate objectives with respect to current and desired outcomes on a six point summated rating scale ranging from "not at all" to "extensively". Effarah analyzed the discrepancy between what was currently taught and what teachers felt should be taught. A t-test was then performed to test statistical significance of the difference in ratings between teachers from large versus small programs. His results indicated that the teachers surveyed felt that more emphasis should be given to E.D.P. instruction in secondary business education.

Tasch (1977) utilized discrepancy evaluation to analyze a need for change in the dentistry curriculum at the University of Louisville. The faculty of the Treatment Planning

Section in the School of Dentistry felt there was a need to update the curriculum in the areas of psychomotor skills, as well as the development of the cognitive and affective domains.

A concern that the evaluators addressed during this study was the amount of variance between expected performance and actual performance that would indicate an acceptable discrepancy, that is, an area in the curriculum that indeed required change. It was believed that the measurement instrument, by quantifying the varying intensities of the discrepancies, would provide the faculty with a data base for prioritizing curriculum needs. One form of questionnaire utilized for the data collection asked faculty respondents to rate various topics in terms of "what is currently done" and "what should be done" on a nine point scale ranging from "none" to "a great deal". Another form asked faculty respondents to rate the degree to which they felt the Treatment Planning Board was meeting faculty needs in specific areas and rate the degree to which faculty thought students viewed the same variables. The scale utilized for this questionnaire was also a nine point summated rating scale.

The faculty found the results of this study neither new or unexpected, but it enabled them to quantify and prioritize the areas needing change. In terms of future curriculum evaluation, the faculty made plans to requery the original respondents and if the analyses were correct,

discrepancies were expected to be less intense or non-existent.

Buttram & Covert (1977) applied the discrepancy evaluation model to a career planning program at the University of Virginia. The researchers felt that evaluation of career counseling programs was an element lacking in the training of career planning counselors and that it was important for the counselors to be able to determine the effectiveness of their efforts.

To design their evaluation, the program staff and evaluator utilized specific criteria to assist in selecting evaluation concerns: (a) areas of functional importance, (b) areas that were problematic, and (c) areas of internal and external political concern. The responses to the evaluation questions resulted in one of three conclusions. First, if a positive discrepancy occurred, as in the cases where responses to items were higher than the standard, it meant that counselors were providing excellent services and no modifications were necessary. Second, if a negative discrepancy occurred, as in the cases where ratings fell below the standard, two decisions were possible. Either the counseling procedures needed revision to meet the standard, or the standard was unrealistic and needed modification. And third, if no discrepancy occurred, as in the cases where ratings of program performance matched the program standard, it meant that the program was operating in accordance with its designed intent.

Sirois & Iwanick (1977) combined the delphi technique and the discrepancy evaluation model to facilitate analysis and provide decision makers with valid data to utilize for formative and summative evaluation purposes. The delphi-discrepancy model was implemented at the University of Connecticut for quality control of federal, state, and locally mandated programs. The combined model included five phases: one, using the delphi technique to establish standards; two, gathering program data in regards to the standards; three, determining the discrepancy status; four, analyzing the discrepancies in relation to other programs in the population; and five, prescribing changes based on the analyses of the discrepancies. A variation in the appreciation of the Euclidean Distance formula was also utilized in this model to provide an index which indicated the similarity between the program status and the standard. The authors suggest four procedures to analyze the discrepancies of the standardized Euclidean Distance values which include: rank ordering, clustering, item analysis and guideline block analysis. Further analysis is recommended to be tailored to the specific needs of the investigator.

Morra (1978) presented the discrepancy evaluation model as an overall framework for the assessment and improvement of effectiveness of simulation/games within education. The evaluation described provided data in the following stages: pre-design evaluation, design evaluation, input/process evaluation, and output evaluation. The output evaluation

analyzed output standards which were the goals or objectives of the program. Measurement instruments utilized in this stage consisted of knowledge tests, application tests and attitude questionnaires. The data obtained from these instruments were analyzed via the analysis of variance technique to determine if a significant change occurred in student performance on pre-test and post-test scores. Several advantages were attributed to discrepancy evaluation within this framework. Adequate planning of the evaluation was ensured which allowed identification and resolution of problems before large resources were invested in the simulations. Results of the evaluation at various stages promoted improvement of the simulation prior to assessing its effectiveness. In addition to providing documentation of evaluation, this model also served as a guide for the implementation of the simulation.

Jonassen (1978) developed an instrument, which utilized discrepancy evaluation, to evaluate instructional television (I.T.V.) programs. The model assumes interaction between teacher, student, and the television program is necessary for I.T.V. to be successful.. Utilizing specific criteria for each of these three components, the amount of discrepancy was thought to be inversely proportional to the successful utilization of the I.T.V. program. The measurement instrument for data collection consisted of a five point semantic differential rating scale which was divided into five main sections: lesson objective, student viewing

behavior, performance, program purpose, and program attributes. The average score of each section was compared with average scores from other sections to determine the discrepancy. If a discrepancy of two or more points existed between any section and the rest, investigation was recommended. If two or more sections differed from the rest by two or more points, the program was considered unsuccessful. Although not stated, the program would also be considered unsuccessful if evaluation of all sections agreed the program was poor.

Weddington (1973) presented a "systems" approach to the determination of needs as a basis for change in the curriculum of the Community Junior College. In this "needs research" portion of the curriculum development process, four levels of curriculum development were identified: the institution level, the curriculum level, the program level, and the course level. Each level existed as a subsystem of the previous level. Implementation of this evaluation process identified the need for curriculum change by subtracting provisions from demands.

Demands were determined by identifying what courses should be offered within a program and what objectives should be stated. These were based on the expected student entry level and the optimum logical sequencing of objectives and courses. Provisions within the current program were based on the present program objectives and courses, their sequencing and the current student entry level. A need for

program change was identified when a discrepancy existed between current program provision and demand of objectives, courses, their sequencing, or the entry level of students. By treating the curriculum as a self-correcting set of systems with feedback loops, a plan for continuous curriculum revision was implemented.

Medley (1978) described the need for a continuing reassessment of foreign language programs if the discipline is to remain part of a dynamic educational system. This needs assessment process enables curriculum designers to derive valid goals and arrange them in order of importance and to prepare performance objectives that will lead to attainment of the goals. The learner's current abilities can be assessed while need statements are developed and strategies are implemented to resolve discrepancies between current and desired student performances.

The primary objective is to derive a set of goals with which to work. Once this has been accomplished, performance objectives for each level of instruction, specific objectives for each unit of instruction and classroom activities are designed to lead to the attainment of objectives and thus the goals.

Next, the goals must be validated with respect to the educational system. This process is an estimate of the extent to which the goals reflect desired outcomes of the educational process. Objectives are then developed and validated which will serve as the basis for evaluating

discrepancies between program objectives and learner outcomes attained. These discrepancies are converted into need statements which are listed in order of importance.

Evaluation History of Curriculum Standards in Nurse Anesthesia Education

Nurses began to administer anesthesia during the last two decades of the 19th century, and by the early years of the 20th century nurses were trained throughout the United States to administer anesthesia. Although there were few formal training programs prior to World War I, the demand for nurse anesthetists grew during the war and in the post-war period, and as a result the number of schools increased. The requirements for nurses who entered these programs primarily consisted of consent of the surgeon and the willingness of the nurses to be taught anesthesia.

In 1933, at the first annual meeting of the National Association of Nurse Anesthetists, the Board of Trustees established "minimum standards" for schools of anesthesia. These minimum standards stipulated the programs should be four months in length, and include a clinical experience of 250 anesthetic procedures and 75 hours of classroom instruction (A.A.N.A., 1969).

Between 1933 and 1940, with the cooperation and assistance of the American Hospital Association, the Education Committee of the National Association of Nurse Anesthetists developed plans for the evaluation of schools of anesthesia and a national examination for graduates of these schools.

A report by this committee in 1937 included the "recommended curriculum" as well as the minimum standards for schools of anesthesia (N.A.N.A., 1937). These standards were established for schools of anesthesia that desired acceptance by the National Association of Nurse Anesthetists and whose graduates could expect to be acceptable candidates for membership in the Association (Thatcher, 1953). After January 1, 1941, all applicants for membership in the newly named American Association of Nurse Anesthetists were required to meet the criteria specified in the revised curriculum.

The use of the minimum standards and the recommended curriculum as the criteria for eligibility for the qualifying examination, and as the basis of evaluations of schools, emphasized the need for a formal accreditation program for schools of anesthesia. In 1952, following approval of the Board of Trustees of the American Association of Nurse Anesthetists, the accreditation program was implemented and these standards became the criteria for accreditation of anesthesia schools. Three years after implementing the accreditation program with these standards, the American Association of Nurse Anesthetists was recognized as the accrediting agency for programs of nurse anesthesia by the United States Office of Education. The Association believed that a ten year interval between revisions of the minimum standards was practical. To accomplish this workshops were held for directors of anesthesia schools. Recommendations were made by participants, and after approval by the

Board of Trustees, the new standards were implemented.

In 1974, changes in the United States Office of Education's criteria for accreditation agencies necessitated major revisions in the educational standards and guidelines for nurse anesthesia programs as well as changes in the accreditation policies and procedures. The Council on Accreditation, with representatives of the public and community of interest, as well as nurse anesthetists, became the accrediting agency for schools of nurse anesthesia which was recognized by the United States Office of Education (A.A.N.A., 1975).

The Council on Accreditation, a semi-autonomous body of the American Association of Nurse Anesthetists until 1978, developed a procedure for review and revision of educational standards for nurse anesthesia programs. Recommendations for revisions in the standards were addressed to the Council by any appropriate persons. If the Council believed a revision was in order, the Education Committee of the American Association of Nurse Anesthetists was requested to recommend changes to the Council on Accreditation. Following dissemination, review, and comments from program directors and members of the community of interest, accepted recommendations were forwarded to the Board of Directors of the American Association of Nurse Anesthetists for review and comment prior to the Council's adoption of the standards.

Since 1978 the Council has been fully autonomous from the American Association of Nurse Anesthetists. The

procedure for revision of the standards has undergone only one change, that is, recommended revisions are not required to be reviewed by the Board of Directors of the Association prior to adoption by the Council. The 1980 standards, which are the most recent revision, require programs to be 24 months in length. Students must administer a minimum of 450 anesthetics and have 800 hours of actual clinical experience. The required academic curriculum is to be taught in a minimum of 450 hours of classroom instruction (Council on Accreditation, 1980).

Research in the area of curriculum evaluation in nurse anesthesia educational programs has been limited. A study by Halliburton (1980) investigated curriculum "intents", of a selected nurse anesthesia program, in relation to the graduates' perception of their preparation to function in the professional setting. A mailed survey was the primary data collection instrument. Respondents rated their adequacy of preparation of 40 behavioral skills using a likert rating scale. The researcher also interviewed other graduates to compare their responses with those obtained by the mailed survey. Data analysis indicated that curriculum intents were congruent with the graduates' perception of adequacy of preparation on 29 of the 40 behaviors. The author concluded that this method of curriculum evaluation identified specific strengths and weaknesses in the curriculum, and provided decision makers with empirical data to use as a basis for curriculum decisions.

Summary

Evaluation of educational programs is important for assessing the need for change within programs and for maintaining quality education. The discrepancy evaluation model, designed by Provus (1971), was developed specifically to be utilized in this capacity. The model has been implemented in various educational programs and has proven effective in identifying areas within the programs that require change.

Within nurse anesthesia educational programs, the discrepancy evaluation model provides a framework by which C.R.N.A. program directors can be involved in the evaluation of academic curriculum requirements. With the academic background of students entering all nurse anesthesia programs expanding to the baccalaureate level in 1987, those individuals involved in curriculum design are wise to plan for the future, so that the program's curriculum and faculty will be able to meet the needs of the students by offering an academic curriculum that acknowledges this enhanced preparation prior to admission. The results of this study provide a data base which identifies C.R.N.A. program director's perceptions of areas needing change within the minimum academic requirements of a nurse anesthesia educational program.

Chapter 3

Methodology

This chapter provides a description of the research methodology. The research design utilized for this study is described. The population is defined and the subjects who participated in this study are discussed. The measurement instrument is presented, and the procedures implemented to establish validity and reliability of the instrument are explained, as well as the data collection procedure. The statistical analyses that were performed to address the research questions stated in Chapter 1 are described.

Research Design

The research design used for this study was a one-way analysis of variance design. The independent variable, program level, was an attribute variable with three levels: certificate, baccalaureate, and masters. The entire population was included in this study and the subjects were fixed within the levels of the independent variable, that is, they were directors of certificate, baccalaureate, or masters programs. Therefore, subjects were not randomly assigned to groups. Three dependent variables were measured in this study: present goal obtainability, future importance of goal, and the discrepancy between future importance and present goal obtainability. These variables were measured on 41 educational goals for nurse anesthesia.

Research Sample

The population this study addressed was nationwide and

consisted of certified registered nurse anesthetist (C.R.N.A.) directors of generic nurse anesthesia educational programs accredited by the Council on Accreditation. The population was identified in the Council on Accreditation of Nurse Anesthesia Educational Programs/Schools: List of Recognized Educational Programs/Schools (1983), (see Appendix A). This publication is updated every July and December, therefore, the December 1983 issue was the most recent publication at the time of this study.

For the purposes of this research the population was divided into three strata: C.R.N.A. directors of certificate programs, C.R.N.A. directors of baccaluareate programs, and C.R.N.A. directors of masters programs. Due to the size of the population, 137 subjects, the entire population was surveyed rather than obtaining a random sample. Usable questionnaires were returned by 116 subjects, that is, 85% of the population. The distribution of the population and respondents by program level are listed in Table 1. The distribution of respondents by program level clearly reflects the distribution of the population by program level.

In addition, respondents identified their program as certificate, optional degree granting, or mandatory degree granting programs. These classifications are illustrated in Table 2. These classifications demonstrate that, as compared to program levels identified by the Council in December 1983, more programs to date have moved to a higher level academic framework.

Table 1

Distribution of Population and Respondents by Program Level

Group	N	Program Level		
		Certificate	Baccalaureate	Masters
Population	137			
n		70	37	30
%		51	27	22
Respondents	116			
n		58	31	27
%		50	26.7	23.3

Note. Program level is as identified in December 1983 list of recognized programs (Council on Accreditation, 1983).

Table 2

Classification of Programs by Academic Degree Obtainable

Classification	n
Certificate	53
Optional Baccaluareate	12
Mandatory Baccaluareate	19
Optional Masters	9
Mandatory Masters	22
Mandatory Baccalaureate-Optional Masters	1

Measurement Instrument

The instrument, entitled "Survey of Educational Goals for Nurse Anesthesia" (see Appendix B), consisted of two main data collection portions: the demographic information and the evaluation of 41 educational goals for nurse anesthesia. Respondents rated the extent they believe each goal is met by the minimum academic requirements of the Council on Accreditation and the extent they believe each goal should be met in the future when students enter all nurse anesthesia programs with a baccalaureate degree. The measurement scales on this instrument consisted of seven point numerical rating scales. The scales, labeled "present goal obtainability" and "future importance of goal", allowed respondents to rate goals on a continuum ranging from "low" to "high". These ratings provided perceptions of C.R.N.A. program directors regarding goals they believe are important for the future in nurse anesthesia education, as well as a discrepancy between "future importance of goal" and "present goal obtainability", which indicated a need for change in the academic requirements.

Validity and Reliability of the Measurement Instrument

A modified delphi technique was utilized to establish validity and reliability of the measurement instrument. The procedure consisted of three mailings of the questionnaire to members of the delphi group for the purposes of reviewing and rating the instrument. The delphi group consisted of the following members:

1. The Executive Secretary to the Council on Accreditation of Nurse Anesthesia Educational Programs/Schools

2. Two C.R.N.A. members of the Council on Accreditation of Nurse Anesthesia Educational Programs/Schools

3. A public member of the Council on Accreditation of Nurse Anesthesia Educational Programs/Schools

4. Two consultants to the Council on Accreditation of Nurse Anesthesia Educational Programs/Schools

5. An educational consultant to the American Association of Nurse Anesthetists

6. A delegate to the Education Committee of the American Association of Nurse Anesthetists

These eight individuals are extremely knowledgeable in the area of nurse anesthesia education and in the standards for nurse anesthesia educational programs mandated by the Council on Accreditation.

Validity. The first mailing of the measurement instrument to the delphi group members was for the purpose of establishing validity. The construct measured in this study was "need for change in the minimum academic curriculum requirements for nurse anesthesia programs". This was determined by identifying any discrepancy between goal obtainability with the current minimum standards and the importance of that goal in the future. Therefore, to establish construct validity the delphi group members evaluated the questionnaire in terms of the goal statements. They reviewed each goal statement in reference to the current

academic requirements and designated which goals should be included in the instrument, which should be modified and how, which should be deleted, and which others should be added. The content validity of this questionnaire was established by having the delphi group members review the goal statements in terms of their representation of content that reflected the current academic standards of the Council, as well as content that would currently be considered enrichment in a nurse anesthesia program rather than a minimum requirement.

In addition, to enhance validity of the instrument, the delphi group members were asked to make comments and suggestions regarding the introduction, demographic questions, and the directions on the questionnaire (see Appendix C). Alterations were made in the instrument based on the feedback provided by this group. Their input determined the final content and language of the measurement instrument.

Reliability. The second and third mailings to the delphi group members, which included the questionnaire in its final form, were to establish reliability of the instrument. To determine the stability, or consistency of the instrument over time, the test-retest method was used. The time interval between mailings of the questionnaire to the delphi group members was three weeks. The importance of these ratings for the purpose of establishing reliability was emphasized to the panel members in the letter of transmittal. The members were instructed not to keep a copy

of their ratings from the second mailing to influence their final ratings on the instrument (see Appendix D).

Each goal statement was evaluated from two perspectives: the extent the goal was perceived to be met by the minimum academic requirements of the Council, and the extent the goal should be met in the future. Because these are considered two separate variables, a reliability coefficient was determined for each variable, i.e., present goal obtainability and future importance of goal (see Table 3). The reliability coefficients were calculated using the Pearson product-moment correlation technique with the Statistical Package for the Social Sciences (S.P.S.S.) (1975).

Table 3

Instrument Reliability

Variable	Coefficient
Present goal obtainability	.88*
Future importance of goal	.79*

Note. $N = 8$

*$p < .01$

Data Collection

The questionnaire was mailed to the 137 C.R.N.A. program directors in the population. A letter of transmittal accompanied the questionnaire which included a statement of the purpose of the study (see Appendix E). The letter

identified a return date as well as a statement which offered respondents a report of the results of the study if they desired. To promote valid ratings of the goals by respondents the transmittal letter informed them that all data would be treated in an anonymous and confidential manner, and that information obtained in this study would be used for statistical purposes and no individual C.R.N.A. director or program would be identified. A stamped, self-addressed envelope was included for respondents to return the questionnaire to the researcher. Ninety-nine questionnaires were returned by the date identified in the transmittal letter.

The day after the specified return date, a follow-up letter was mailed to non-respondents (see Appendix F). This letter reaffirmed the importance of the respondents' contribution to this study. Another copy of the questionnaire was enclosed with this letter, and the deadline date for their return was specified. Seventeen additional questionnaires were returned.

Statistical Analysis

Two kinds of data were obtained in this study: demographic data describing the respondents and evaluative data pertaining to educational goals for nurse anesthesia. All data were entered into computer files in the Michigan Terminal System (M.T.S.), and statistical analyses were performed using the Statistical Package for the Social Sciences (S.P.S.S.) (1975).

Statistical analysis of demographic data consisted of

calculating frequencies and percentages of the responses on each item. Evaluative data regarding the educational goals for nurse anesthesia were analyzed as interval scale measurements. Gardner (1975) addressed the nature of the relationship between ordinal and interval scales, pointing out that with rating scales the distinction is not clear cut. Ordinal scale measurements merely place the objects being measured in rank order with no meaning associated to the size of interval between the measurements. Conversely, interval measurements do represent equality of units over the scale, and relative size between pairs of measurements may be interpreted as meaningful.

According to the criteria developed by Stevens and by Siegel (cited in Gardner, 1975), which include the mode of instrument construction and the distribution of scores yielded by the instrument. rating scales would be considered as ordinal scales of measurement and therefore, not appropriate for such parametric statistics as T-tests and F-tests. However, the literature is abound with those who do not agree with Stevens and Siegel. This disagreement focuses on two main issues: one, the distinction between ordinal and interval scales cannot always be easily made and two, the necessity of some requirements for parametric statistics may not be critical.

Gardner (1975) pointed out that a summated-rating attitude scale occupies the intermediate position on the continuum of ordinal/interval scales. He stated:

> On the one hand, there is no claim that equal increments in observed score along the scale represent equal increments in the underlying latent variable being measured, on the other hand, the mode of construction in each case suggests that the deviations from interval properties will not be extreme. (p. 53)

Heerman and Braskamp (cited in Gardner, 1975) summarized the debate as follows:

> Most investigators seem to agree that scale type is irrelevant to the choice of statistical tool, and even though the use of parametric methods requires more assumpations than non-parametric methods, failure to meet these assumptions does not appear to have serious consequences in most instances. (p. 37)

Kerlinger (1964) made an important distinction between ipsative and normative measures. Ipsative measures are systematically affected by ratings of other items on an instrument, and therefore, violate the basic assumption of independence of ratings. Normative measures, however, can vary independently and are not affected by ratings of other items on the instrument. Therefore, normative data are appropriately analyzed by measures of central tendency and variances, while ipsative data are not. He also identified numerical rating scales as measurement scales that yield data that may represent equal intervals, and therefore may be analyzed as interval measurements.

Data pertaining to the educational goals for nurse anesthesia were analyzed by both descriptive and inferential statistics. Descriptive statistics included the computation of discrepancies between ratings of present goal obtainability and future importance of the goal for each of the 41 goals. Percentages of score frequencies for the entire

sample were also computed. The mean scores were calculated as measures of central tendency, and standard deviations were computed to express the variability of scores. Correlation coefficients were computed on the mean ratings by each program level. Inferential statistical analysis of the data was performed by using the one-way analysis of variance technique with subsequent application of the a posteriori Duncan multiple range test.

Chapter 4

Data Analysis and Findings

This chapter presents the results of the statistical analysis of the data and the findings of this study. Descriptive statistics pertaining to the respondents are presented, as well as their ratings of each of the 41 educational goals. Measures of central tendency and variability of the ratings are identified for each program level with an analysis of differences between program levels. Correlations of ratings between each pair of program levels are presented. Data analysis is summarized in relation to the research questions of this study.

Description of Respondents

The C.R.N.A. program directors who participated in this study consisted of 44.3% males and 55.7% females. The age ranges of these subjects are listed in Table 4.

Table 4

Age Ranges of C.R.N.A. Program Directors

Age range	n
25 to 30	4
31 to 40	52
41 to 50	44
over 50	13

Note. N = 113.

At the time of this study 94.78% of the C.R.N.A. program directors held academic degrees. Table 5 indicates the percentage of respondents at the baccalaureate, masters, and doctoral level. In addition to the 5.22% who held doctoral degrees, another 21% indicated they were currently pursuing a doctoral degree.

Table 5

Percentage of C.R.N.A. Program Directors at Academic Levels

Academic level	%
Doctoral	5.22
Masters	63.48
Baccalaureate	26.08
No degree obtained	5.22

Note. N = 115.

As shown in Table 6, the discipline in which the greatest number of program directors have obtained their baccalaureate degree is Nursing, while Education is the discipline in which most program directors have obtained their masters degree.

Table 6

Academic Degrees of C.R.N.A. Program Directors

Academic degree	n
Baccalaureate[a]	
Nursing	29
Anesthesia	15
Education	25
Biophysical Science	17
Nursing and Anesthesia	2
Nursing and Science	1
Other[b]	20
Not attained	6
Masters[c]	
Nursing	9
Anesthesia	4
Education	50
Biophysical Sciences	2
Other[d]	14
Not attained	36

[a] N = 115.
[b] Administration, Liberal Arts, Professional Studies, Theology, Psychology, Sociology, Health Science, Health Care Administration, and Inhalation Therapy.
[c] N = 115.
[d] Counseling, Health Care Administration, Organizational Communication, Administration, Psychology, Health Sciences.

Analysis of Educational Goals

C.R.N.A. program directors rated the 41 educational goals on "present goal obtainability" and "future importance of goal". The numerical rating scales ranged from a "high" rating of seven to a "low" rating of one. By subtracting a respondent's rating of present goal obtainability from their rating of future importance of that goal, a discrepancy was computed which indicated their perception of needed change. A positive discrepancy value indicated that the respondent believed the goal should be met to a greater extent in the future than they perceived it met by the current academic requirements. Conversely, a negative discrepancy value indicated that the respondent believed the goal was met to a greater extent by the current academic requirements than it should be met in the future. A discrepancy value of zero indicated that the respondent believed the goal should be met to the same extent in the future as they perceived it met by the current academic requirements. All three variables, present obtainability, future importance, and discrepancy were analyzed for each educational goal.

Goal 1. This goal addressed students acquiring knowledge in the organization and management of an anesthesia department. The distribution of ratings by percentages is identified in Table 7.

Analysis of variance at $p < .05$ indicated no significant difference between the ratings by program directors of certificate, baccalaureate, and masters programs on; present

Table 7

Percentages of Ratings on Goal 1 by C.R.N.A. Program Directors

	Variable		
Rating	Present obtainability[a]	Future importance[b]	Discrepancy[c]
7	11.2	27.8	-
6	13.8	23.5	1.7
5	19.0	20.0	0.9
4	16.4	13.9	5.2
3	24.1	7.8	10.4
2	9.5	4.3	15.7
1	6.0	2.6	21.7
0	-	-	40.0
-1	-	-	1.7
-2	-	-	0.9
-4	-	-	1.7

Note. Dash indicates no data in cell.
[a]N = 116. [b,c]N = 115.

goal obtainability (see Appendix G-1), on future importance of the goal (see Appendix G-2), or on the discrepancy (see Appendix G-3). The mean ratings of goal 1 by program level are listed in Table 8.

Goal 2. This goal addressed students acquiring knowledge of ethical considerations for the profession. The distribution of ratings by percentages is identified in Table 9.

Analysis of variance at $p < .05$ indicated no significant difference between the ratings by program directors of certificate, baccalaureate, and masters programs on; present goal obtainability (see Appendix G-4), or on future importance of the goal (see Appendix G-5). There was a significant difference, however, on the discrepancy (see Appendix G-6). The mean ratings of goal 2 by program level are listed in Table 10. Results of the Duncan multiple range test at $p < .05$ indicated the mean discrepancy perceived by directors of masters programs was significantly different from both certificate and baccalaureate program directors.

Goal 3. This goal addressed students acquiring knowledge of the history of nurse anesthesia practice. The distribution of ratings by percentages is identified in Table 11.

Analysis of variance at $p < .05$ indicated no significant difference between the ratings by program directors of certificate, baccalaureate, and masters programs on; present goal obtainability (see Appendix G-7), on future importance

Table 8

Mean Ratings of Goal 1 by Program Level

	Program level		
Variable	Certificate[a]	Baccalaureate[b]	Masters[c]
Present obtainability			
M	4.069	4.613	3.963
SD	1.543	1.626	2.066
Future importance			
M	5.241	5.613	4.885
SD	1.502	1.358	2.007
Discrepancy			
M	1.172	1.000	1.039
SD	1.728	1.095	1.908

[a] $n = 58$. [b] $n = 31$. [c] $n = 27$ on present obtainability but $n = 26$ on other variables.

Table 9

Percentages of Ratings on Goal 2 by C.R.N.A. Program Directors

Rating	Variable		
	Present obtainability[a]	Future importance[b]	Discrepancy[c]
7	35.3	54.3	-
6	19.0	25.9	0.9
5	17.2	12.1	-
4	15.5	4.3	1.7
3	7.8	1.7	11.2
2	4.3	1.7	13.8
1	0.9	-	14.7
0	-	-	54.3
-1	-	-	0.9
-2	-	-	0.9
-3	-	-	0.9
-4	-	-	0.9

Note. Dash indicates no data in cell.

[a,b,c] $N = 116$.

Table 10

Mean Ratings of Goal 2 by Program Level

	Program Level		
Variable	Certificate[a]	Baccalaureate[b]	Masters[c]
Present obtainability			
M	5.414	5.677	5.148
SD	1.463	1.600	1.726
Future importance			
M	6.086	6.161	6.556
SD	1.189	1.186	0.751
Discrepancy			
M	0.672[d]	0.484[d]	1.408[e]
SD	1.276	1.235	1.647

Note. Discrepancy means with different superscripts differ significantly at $p < .05$.
[a] $n = 58$. [b] $n = 31$. [c] $n = 27$.

Table 11

Percentages of Ratings on Goal 3 by C.R.N.A. Program Directors

Rating	Variable		
	Present obtainability[a]	Future importance[b]	Discrepancy[c]
7	20.7	19.8	-
6	8.6	12.9	0.9
5	18.1	18.1	-
4	21.6	21.6	0.9
3	14.7	12.9	1.7
2	12.1	9.5	9.5
1	4.3	5.2	13.8
0	-	-	54.3
-1	-	-	7.8
-2	-	-	5.2
-3	-	-	6.0

Note. Dash indicates no data in cell.
[a,b,c] $N = 116$.

of the goal (see Appendix G-8), or on the discrepancy (see Appendix G-9). The mean ratings of goal 3 by program level are listed in Table 12.

Goal 4. This goal addressed students acquiring knowledge of the history of the American Association of Nurse Anesthetists. The distribution of ratings by percentages is identified in Table 13.

Analysis of variance at $p < .05$ indicated no significant difference between the ratings by program directors of certificate, baccalaureate, and masters programs on; present goal obtainability (see Appendix G-10), on future importance of the goal (see Appendix G-11), or on the discrepancy (see Appendix G-12). The mean ratings of goal 4 by program level are listed in Table 14.

Goal 5. This goal addressed students acquiring knowledge of the purposes and functions of the American Association of Nurse Anesthetists. The distribution of ratings by percentages is identified in Table 15.

Analysis of variance at $p < .05$ indicated no significant difference between the ratings by program directors of certificate, baccalaureate, and masters programs on; present goal obtainability (see Appendix G-13), on future importance of the goal (see Appendix G-14), or on the discrepancy (see Appendix G-15). The mean ratings of goal 5 by program level are listed in Table 16.

Goal 6. This goal addressed students acquiring knowledge of the purposes and functions of the state associations

Table 12

Mean Ratings of Goal 3 by Program Level

	Program level		
Variable	Certificate[a]	Baccalaureate[b]	Masters[c]
Present obtainability			
M	4.431	4.613	4.333
SD	1.748	1.856	1.881
Future importance			
M	4.604	4.452	4.593
SD	1.589	1.964	2.005
Discrepancy			
M	0.173	-0.161	0.260
SD	1.157	1.294	1.913

[a] $n = 58$. [b] $n = 31$. [c] $n = 27$.

Table 13

Percentages of Ratings on Goal 4 by C.R.N.A. Program Directors

Rating	Variable		
	Present obtainability[a]	Future importance[b]	Discrepancy[c]
7	22.4	29.3	-
6	12.9	17.2	0.9
5	14.7	19.8	0.9
4	22.4	19.0	2.6
3	11.2	6.9	8.6
2	12.1	3.4	9.5
1	4.3	4.3	13.8
0	-	-	52.6
-1	-	-	5.2
-2	-	-	3.4
-3	-	-	1.7
-6	-	-	0.9

Note. Dash indicates no data in cell.
a,b,c $N = 116$.

Table 14

Mean Ratings of Goal 4 by Program Level

	Program level		
Variable	Certificate[a]	Baccalaureate[b]	Masters[c]
Present obtainability			
M	4.535	4.903	4.370
SD	1.769	1.972	1.801
Future importance			
M	5.172	5.129	5.148
SD	1.569	1.928	1.658
Discrepancy			
M	0.637	0.226	0.778
SD	1.459	1.820	1.671

[a] $n = 58$. [b] $n = 31$. [c] $n = 27$.

Table 15

Percentages of Ratings on Goal 5 by C.R.N.A. Program Directors

Rating	Variable		
	Present obtainability[a]	Future importance[b]	Discrepancy[c]
7	25.9	57.8	-
6	14.7	23.3	1.7
5	16.4	5.2	3.4
4	12.9	9.5	8.6
3	15.5	1.7	10.3
2	12.9	1.7	17.2
1	1.7	0.9	14.7
0	-	-	43.1
-2	-	-	0.9

Note. Dash indicates no data in cell.
[a,b,c] $N = 116$.

Table 16

Mean Ratings of Goal 5 by Program Level

	Program level		
Variable	Certificate[a]	Baccalaureate[b]	Masters[c]
Present obtainability			
M	4.810	5.097	4.296
SD	1.722	1.973	1.857
Future importance			
M	6.259	6.226	5.926
SD	1.193	1.384	1.357
Discrepancy			
M	1.449	1.129	1.630
SD	1.656	1.648	1.644

[a] $n = 58$. [b] $n = 31$. [c] $n = 27$.

of nurse anesthetists. The distribution of ratings by percentages is identified in Table 17.

Analysis of variance at $p < .05$ indicated no significant difference between the ratings by program directors of certificate, baccalaureate, and masters programs on; present goal obtainability (see Appendix G-16), on future importance of the goal (see Appendix G-17), or on the discrepancy (see Appendix G-18). The mean ratings of goal 6 by program level are listed in Table 18.

Goal 7. This goal addressed students acquiring knowledge in the history of the Councils; their structure, purposes and functions. The distribution of ratings by percentages is identified in Table 19.

Analysis of variance at $p < .05$. indicated no significant difference between the ratings by program directors of certificate, baccalaureate, and masters programs on; present goal obtainability (see Appendix G-19), or on future importance of the goal (see Appendix G-20). There was a significant difference, however, on the discrepancy (see Appendix G-21). The mean ratings of goal 7 by program level are listed in Table 20. Results of the Duncan multiple range test at $p < .05$ indicated the mean discrepancies perceived by directors of masters and baccalaureate programs were significantly different.

Goal 8. This goal addressed students acquiring knowledge of legal aspects pertinent to the practice of nurse anesthesia. The distribution of ratings by percentages is

Table 17

Percentages of Ratings on Goal 6 by C.R.N.A. Program Directors

Rating	Variable		
	Present obtainability[a]	Future importance[b]	Discrepancy[c]
7	13.8	43.1	-
6	17.2	25.0	3.4
5	12.9	13.8	6.0
4	13.8	12.1	8.6
3	17.2	4.3	11.2
2	19.0	0.9	17.2
1	6.0	0.9	17.2
0	-	-	35.3
-2	-	-	0.9

Note. Dash indicates no data in cell.
a,b,c $N = 116$.

Table 18

Mean Ratings of Goal 6 by Program Level

	Program level		
Variable	Certificate[a]	Baccalaureate[b]	Masters[c]
Present obtainability			
M	4.190	4.677	3.482
SD	1.821	2.072	1.626
Future importance			
M	5.914	5.807	5.741
SD	1.247	1.352	1.534
Discrepancy			
M	1.724	1.130	2.259
SD	1.890	1.522	1.723

[a] $n = 58$. [b] $n = 21$. [c] $n = 27$.

Table 19

Percentages of Ratings on Goal 7 by C.R.N.A. Program Directors

Rating	Variable		
	Present obtainability[a]	Future importance[b]	Discrepancy[c]
7	19.1	39.1	-
6	11.3	20.0	2.6
5	10.4	12.2	4.3
4	15.7	24.3	9.6
3	15.7	2.6	13.9
2	18.3	0.9	16.5
1	9.6	0.9	10.4
0	-	-	37.4
-1	-	-	2.6
-2	-	-	2.6

Note. Dash indicates no data in cell.
[a,b,c] N = 115.

Table 20

Mean Ratings of Goal 7 by Program Level

	Program Level		
Variable	Certificate[a]	Baccalaureate[b]	Masters[c]
Present obtainability			
M	4.105	4.516	3.593
SD	1.943	2.174	1.927
Future importance			
M	5.597	5.516	5.815
SD	1.361	1.610	1.242
Discrepancy			
M	1.492[d,e]	1.000[d]	2.222[e]
SD	1.919	1.528	1.847

Note. Discrepancy means with different superscripts differ significantly at $p < .05$.
[a] $n = 57$. [b] $n = 31$. [c] $n = 27$.

identified in Table 21.

Analysis of variance at $p < .05$ indicated no significant difference between the ratings by program directors of certificate, baccalaureate, and masters programs on; present goal obtainability (see Appendix G-22), on future importance of the goal (see Appendix G-23), or on the discrepancy (see Appendix G-24). The mean ratings of goal 8 by program level are listed in Table 22.

Goal 9. This goal addressed students acquiring knowledge of positive public relation techniques they can utilize as practitioners. The distribution of ratings by percentages is identified in Table 23.

Analysis of variance at $p < .05$ indicated no significant difference between the ratings by program directors of certificate, baccalaureate, and masters programs on; present goal obtainability (see Appendix G-25), on future importance of the goal (see Appendix G-26), or on the discrepancy (see Appendix G-27). The mean ratings of goal 9 by program level are listed in Table 24.

Goal 10. This goal addressed students acquiring knowledge of legislative issues affecting nurse anesthesia practice. The distribution of ratings by percentages is identified in Table 25.

Analysis of variance at $p < .05$ indicated no significant difference between the ratings by program directors of certificate, baccalaureate, and masters programs on; present goal obtainability (see Appendix G-28), on future importance

Table 21

Percentages of Ratings on Goal 8 by C.R.N.A. Program Directors

Rating	Variable		
	Present obtainability[a]	Future importance[b]	Discrepancy[c]
7	40.5	79.3	-
6	16.4	10.3	0.9
5	13.8	6.0	1.7
4	15.5	3.4	5.2
3	10.3	0.9	9.5
2	2.6	-	17.2
1	0.9	-	17.2
0	-	-	47.4
-1	-	-	0.9

Note. Dash indicates no data in cell.
[a,b,c] $N = 116$.

Table 22

Mean Ratings of Goal 8 by Program Level

	Program level		
Variable	Certificate[a]	Baccalaureate[b]	Masters[c]
Present obtainability			
M	5.535	5.807	5.074
SD	1.478	1.493	1.838
Future importance			
M	6.673	6.613	6.593
SD	0.846	0.803	0.797
Discrepancy			
M	1.138	0.806	1.519
SD	1.357	1.276	2.650

[a] $n = 58$. [b] $n = 31$. [c] $n = 27$.

Table 23

Percentages of Ratings on Goal 9 by C.R.N.A. Program Directors

Rating	Variable		
	Present obtainability[a]	Future importance[b]	Discrepancy[c]
7	7.8	48.3	-
6	12.1	20.7	12.1
5	6.0	16.4	12.1
4	17.2	12.9	8.6
3	12.1	-	19.8
2	16.4	0.9	17.2
1	28.4	0.9	14.7
0	-	-	14.7
-1	-	-	0.9

Note. Dash indicates no data in cell.

[a,b,c] $N = 116$.

Table 24

Mean Ratings of Goal 9 by Program Level

	Program level		
Variable	Certificate[a]	Baccalaureate[b]	Masters[c]
Present obtainability			
M	3.224	3.839	2.556
SD	1.883	2.146	1.948
Future importance			
M	5.983	6.161	5.778
SD	1.318	1.128	1.188
Discrepancy			
M	2.759	2.322	3.222
SD	1.967	1.973	1.888

[a] $n = 58$. [b] $n = 31$. [c] $n = 27$.

Table 25

Percentages of Ratings on Goal 10 by C.R.N.A. Program Directors

Rating	Variable		
	Present obtainability[a]	Future importance[b]	Discrepancy[c]
7	15.5	69.0	-
6	10.3	16.4	6.0
5	13.8	9.5	11.2
4	11.2	5.2	18.1
3	18.1	-	16.4
2	19.8	-	15.5
1	11.2	-	14.7
0	-	-	18.1

Note. Dash indicates no data in cell.
[a,b,c] N = 116.

of the goal (see Appendix G-29), or on the discrepancy (see Appendix G-30). The mean ratings for goal 10 by program level are listed in Table 26.

Goal 11. This goal addressed students acquiring knowledge of mechanisms to actively participate in legislative issues affecting the profession of nurse anesthesia. The distribution of ratings by percentages is identified in Table 27.

Analysis of variance at $p < .05$ indicated no significant difference between the ratings by program directors of certificate, baccalaureate, and masters programs on; present goal obtainability (see Appendix G-31), on future importance of the goal (see Appendix G-32), or on the discrepancy (see Appendix G-33). The mean ratings of goal 11 are listed in Table 28.

Goal 12. This goal addressed students acquiring knowledge of issues affecting the nursing profession in general. The distribution of ratings by percentages is identified in Table 29.

Analysis of variance at $p < .05$ indicated no significant difference between the ratings by program directors of certificate, baccalaureate, and masters programs on; present goal obtainability (see Appendix G-34), on future importance of the goal (see Appendix G-35), or on the discrepancy (see Appendix G-36). The mean ratings of goal 12 by program level are listed in Table 30.

Table 26

Mean Ratings of Goal 10 by Program Level

	Program Level		
Variable	Certificate[a]	Baccalaureate[b]	Masters[c]
Present obtainability			
M	3.879	4.355	3.407
SD	1.865	2.138	2.024
Future importance			
M	6.586	6.484	6.296
SD	0.726	0.926	1.068
Discrepancy			
M	2.707	2.129	2.889
SD	1.727	1.893	2.006

[a] $n = 58$. [b] $n = 31$. [c] $n = 27$.

Table 27

Percentages of Ratings on Goal 11 by C.R.N.A. Program Directors

	Variable		
Rating	Present obtainability[a]	Future importance[b]	Discrepancy[c]
7	7.8	55.2	-
6	9.5	21.6	9.5
5	9.5	10.3	16.4
4	14.7	9.5	8.6
3	12.9	3.4	19.8
2	23.3	-	21.6
1	22.4	-	14.7
0	-	-	9.5

Note. Dash indicates no data in cell.
[a,b,c] N = 116.

Table 28

Mean Ratings of Goal 11 by Program Level

	Program Level		
Variable	Certificate[a]	Baccalaureate[b]	Masters[c]
Present obtainability			
M	3.138	3.903	2.741
SD	1.840	2.055	1.831
Future importance			
M	6.190	6.290	5.926
SD	1.115	1.006	1.385
Discrepancy			
M	3.052	2.387	3.185
SD	1.811	1.764	1.798

[a] $n = 58$. [b] $n = 31$. [c] $n = 27$.

Table 29

Percentages of Ratings on Goal 12 by C.R.N.A. Program Directors

	Variable		
Rating	Present obtainability[a]	Future importance[b]	Discrepancy[c]
7	17.2	49.1	-
6	3.4	19.8	6.0
5	10.3	15.5	11.2
4	10.3	8.6	12.1
3	17.2	4.3	18.1
2	25.0	1.7	17.2
1	16.4	0.9	12.9
0	-	-	20.7
-1	-	-	0.9
-2	-	-	0.9

Note. Dash indicates no data in cell.
[a,b,c] $N = 116$.

Table 30

Mean Ratings of Goal 12 by Program Level

	Program Level		
Variable	Certificate[a]	Baccalaureate[b]	Masters[c]
Present obtainability			
M	3.276	4.129	3.371
SD	2.059	2.172	1.864
Future importance			
M	5.862	6.129	5.815
SD	1.382	1.232	1.520
Discrepancy			
M	2.586	2.000	2.444
SD	2.111	1.770	1.625

[a] $n = 58$. [b] $n = 31$. [c] $n = 27$.

Goal 13. This goal addressed students acquiring knowledge of various employment opportunities for nurse anesthetists. The distribution of ratings by percentages is identified in Table 31.

Analysis of variance at $p < .05$ indicated no significant difference between the ratings by program directors of certificate, baccalaureate, and masters programs on; present goal obtainability (see Appendix G-37), on future importance of the goal (see Appendix G-38), or on the discrepancy (see Appendix G-39). The mean ratings of goal 13 by program level are listed in Table 32.

Goal 14. This goal addressed students acquiring the important concepts of successful implementation of the anesthesia care team. The distribution of ratings by percentages is identified in Table 33.

Analysis of variance at $p < .05$ indicated no significant difference between the ratings of program directors of certificate, baccalaureate, and masters programs on; present goal obtainability (see Appendix G-40), on future importance of the goal (see Appendix G-41), or on the discrepancy (see Appendix G-42). The mean ratings of goal 14 by program level are listed in Table 34.

Goal 15. This goal addressed students learning the responsibilities of independent practice in rural communities. The distribution of ratings by percentages is identified in Table 35.

Table 31

Percentages of Ratings on Goal 13 by C.R.N.A. Program Directors

	Variable		
Rating	Present obtainability[a]	Future importance[b]	Discrepancy[c]
7	22.4	38.8	-
6	12.9	27.6	-
5	15.5	16.4	3.4
4	12.9	14.7	6.9
3	13.8	0.9	14.7
2	12.1	1.7	22.4
1	10.3	-	12.9
0	-	-	38.8
-3	-	-	0.9

Note. Dash indicates no data in cell.
[a,b,c] N = 116.

Table 32

Mean Ratings of Goal 13 by Program Level

	Program Level		
Variable	Certificate[a]	Baccalaureate[b]	Masters[c]
Present obtainability			
M	4.086	5.000	4.370
SD	1.931	2.206	1.944
Future importance			
M	5.759	6.194	5.593
SD	1.031	1.424	1.279
Discrepancy			
M	1.673	1.194	1.223
SD	1.549	1.537	1.450

[a] $n = 58$. [b] $n = 31$. [c] $n = 27$.

Table 33

Percentages of Ratings on Goal 14 by C.R.N.A. Program Directors

Rating	Variable		
	Present obtainability[a]	Future importance[b]	Discrepancy[c]
7	26.3	53.9	-
6	19.3	17.4	1.8
5	14.9	15.7	1.8
4	14.0	11.3	5.3
3	14.9	1.7	11.4
2	6.1	-	14.9
1	4.4	-	16.7
0	-	-	46.5
-1	-	-	0.9
-2	-	-	0.9

Note. Dash indicates no data in cell.

[a] $N = 114$. [b] $N = 115$. [c] $N = 114$.

Table 34

Mean Ratings of Goal 14 by Program Level

	Program Level		
Variable	Certificate[a]	Baccalaureate[b]	Masters[c]
Present obtainability			
M	5.053	5.067	4.482
SD	1.827	1.596	1.968
Future importance			
M	6.088	6.290	5.926
SD	1.184	1.071	1.141
Discrepancy			
M	1.035	1.234	1.444
SD	1.625	1.331	1.578

[a] $n = 57$. [b] $n = 31$ on future importance but $n = 30$ on other variables. [c] $n = 27$.

Table 35

Percentages of Ratings on Goal 15 by C.R.N.A. Program Directors

	Variable		
Rating	Present obtainability[a]	Future importance[b]	Discrepancy[c]
7	14.7	41.4	-
6	11.2	22.4	2.6
5	13.8	21.6	3.4
4	17.2	10.3	10.3
3	17.2	3.4	19.8
2	10.3	-	20.7
1	15.5	0.9	15.5
0	-	-	26.7
-2	-	-	0.9

Note. Dash indicates no data in cell.
a,b,c, $N = 116$.

Analysis of variance at $p < .05$ indicated no significant difference between the ratings by program directors of certificate, baccalaureate, and masters programs on; present goal obtainability (see Appendix G-43), on future importance of the goal (see Appendix G-44), or on the discrepancy (see Appendix G-45). The mean ratings of goal 15 by program level are listed in Table 36.

Goal 16. This goal addressed students acquiring knowledge of basic psychology. The distribution of ratings by percentages is identified in Table 37.

Analysis of variance at $p < .05$ indicated no significant difference between the ratings by program directors of certificate, baccaluareate, and masters programs on; present goal obtainability (see Appendix G-46), on future importance of the goal (see Appendix G-47), or on the discrepancy (see Appendix G-48). The mean ratings of goal 16 by program level are listed in Table 38.

Goal 17. This goal addressed students acquiring knowledge of anatomy, physiology, and pathophysiology. The distribution of ratings by percentages is identified in Table 39.

Analysis of variance at $p < .05$ indicated a significant difference between the ratings by program directors of certificate, baccaluareate, and masters programs on; present goal obtainability (see Appendix G-49). There was no significant difference on the future importance of the goal (see Appendix G-50), however, the discrepancy was significant at

Table 36

Mean Ratings of Goal 15 by Program Level

	Program Level		
Variable	Certificate[a]	Baccalaureate[b]	Masters[c]
Present obtainability			
M	3.862	4.290	3.778
SD	2.047	1.717	2.136
Future importance			
M	5.845	6.097	5.556
SD	1.182	1.193	1.423
Discrepancy			
M	1.983	1.807	1.778
SD	1.712	1.352	1.847

[a] $n = 58$. [b] $n = 31$. [c] $n = 27$.

Table 37

Percentages of Ratings on Goal 16 by C.R.N.A. Program Directors

Rating	Variable		
	Present obtainability[a]	Future importance[b]	Discrepancy[c]
7	15.7	22.8	-
6	14.8	17.5	0.9
5	12.2	20.2	-
4	23.5	21.9	0.9
3	13.9	8.8	9.6
2	13.9	2.6	14.9
1	6.1	6.1	21.1
0	-	-	40.4
-1	-	-	7.0
-2	-	-	1.8
-4	-	-	1.8
-5	-	-	0.9
-6	-	-	0.9

Note. Dash indicates no data in cell.
[a] N = 115. [b] N = 114. [c] N = 114.

Table 38

Mean Ratings of Goal 16 by Program Level

	Program Level		
Variable	Certificate[a]	Baccalaureate[b]	Masters[c]
Present obtainability			
M	4.172	4.733	4.037
SD	1.739	1.856	1.931
Future importance			
M	4.793	5.200	4.846
SD	1.630	1.750	1.826
Discrepancy			
M	0.621	0.467	0.769
SD	1.497	1.503	3.141

[a] $n = 58$. [b] $n = 30$. [c] $n = 27$ on present obtainability but $n = 26$ on other variables.

Table 39

Percentages of Ratings on Goal 17 by C.R.N.A. Program Directors

	Variable		
Rating	Present obtainability[a]	Future importance[b]	Discrepancy[c]
7	53.0	83.6	-
6	26.1	12.1	0.9
5	13.0	3.4	0.9
4	4.3	-	0.9
3	1.7	-	3.5
2	0.9	-	9.6
1	0.9	0.9	22.6
0	-	-	60.0
-1	-	-	0.9
-6	-	-	0.9

Note. Dash indicates no data in cell.
[a] $N = 115$. [b] $N = 116$. [c] $N = 115$.

$p < .01$ (see Appendix G-51). The mean ratings of goal 17 by program level are listed in Table 40. Results of the Duncan multiple range test at $p < .05$ indicated the mean rating on present goal obtainability and the mean discrepancy perceived by masters program directors were significantly different from the mean ratings and discrepancies of both certificate and baccalaureate program directors.

Goal 18. This goal addressed students acquiring knowledge of general, organic, and inorganic chemistry applicable to anesthesia. The distribution of ratings by percentages is identified in Table 41.

Analysis of variance at $p < .05$ indicated a significant differenct between the ratings by program directors of certificate, baccalaureate, and masters programs on; present goal obtainability (see Appendix G-52). There was no significant difference on the future importance of the goal (see Appendix G-53), however, the discrepancy was significant at $p < .05$ (see Appendix G-54). The mean ratings of goal 18 by program level are listed in Table 42. Results of the Duncan multiple range test at $p < .05$ indicated the mean rating on present goal obtainability and the mean discrepancy perceived by masters program directors were significantly different from the mean ratings and discrepancies of both certificate and baccalaureate program directors.

Goal 19. This goal addressed students acquiring knowledge of biochemistry applicable to anesthesia. The distribution of ratings by percentages is identified in Table 43.

Table 40

Mean Ratings of Goal 17 by Program Level

Variable	Program Level		
	Certificate[a]	Baccalaureate[b]	Masters[c]
Present obtainability			
M	6.362[d]	6.290[d]	5.654[e]
SD	1.004	0.783	1.623
Future importance			
M	6.707	6.807	6.815
SD	0.918	0.402	0.483
Discrepancy			
M	0.345[f]	0.517[f]	1.230[g]
SD	1.193	0.724	1.657

Note. Present obtainability means with different superscripts significantly at $p < .05$. Discrepancy means with different superscripts differ significantly at $p < .05$.
[a]$n = 58$ on future importance but $n = 57$ on other variable.
[b]$n = 31$. [c]$n = 27$.

Table 41

Percentages of Ratings on Goal 18 by C.R.N.A. Program Directors

Rating	Variable		
	Present obtainability[a]	Future importance[b]	Discrepancy[c]
7	42.0	66.4	-
6	24.1	20.7	0.9
5	17.2	6.9	1.7
4	6.9	4.3	2.6
3	5.2	0.9	5.2
2	2.6	0.9	13.8
1	1.7	-	14.7
0	-	-	54.3
-1	-	-	3.4
-2	-	-	1.7
-3	-	-	0.9
-5	-	-	0.9

Note. Dash indicates no data in cell.
[a,b,c] N = 116.

Table 42

Mean Ratings of Goal 18 by Program Level

	Program Level		
Variable	Certificate[a]	Baccalaureate[b]	Masters[c]
Present obtainability			
M	5.931[d]	6.065[d]	5.074[e]
SD	1.241	1.153	1.979
Future importance			
M	6.414	6.548	6.407
SD	1.009	0.810	1.047
Discrepancy			
M	0.483[f]	0.483[f]	1.333[g]
SD	1.260	1.235	2.057

Note. Present obtainability means with different superscripts differ significantly at $p < .05$. Discrepancy means with different superscripts differ significantly at $p < .05$.
[a]$n = 58$. [b]$n = 31$. [c]$n = 27$.

Table 43

Percentages of Ratings on Goal 19 by C.R.N.A. Program Directors

Rating	Variable		
	Present obtainability[a]	Future importance[b]	Discrepancy[c]
7	31.9	62.9	-
6	17.2	25.0	0.9
5	26.7	6.9	3.4
4	9.5	5.2	4.3
3	6.9	-	8.6
2	6.0	-	15.5
1	1.7	0	19.0
0	-	-	46.6
-1	-	-	0.9
-2	-	-	0.9

Note. Dash indicates no data in cell.
[a,b,c] $N = 116$.

Analysis of variance at $p < .05$ indicated a significant difference between ratings by program directors of certificate, baccalaureate, and masters programs on; present goal obtainability (see Appendix G-55). There was no significant difference on the future importance of the goal (see Appendix G-56), however, the discrepancy was significant at $p < .05$ (see Appendix G-57). The mean ratings of goal 19 by program level are listed in Table 44. Results of the Duncan multiple range test at $p < .05$ indicated the mean ratings on present goal obtainability were significantly different between program directors of baccalaureate and masters programs. The mean discrepancy perceived by masters program directors was significantly different from the mean discrepancies of both certificate and baccalaureate program directors.

Goal 20. This goal addressed students acquiring knowledge in the principles of physics applicable to anesthesia. The distribution of ratings by percentages is identified in Table 45.

Analysis of variance at $p < .05$ indicated no significant difference between ratings by program directors of certificate, baccalaureate, and masters programs on; present goal obtainability (see Appendix G-58), or on the future importance of the goal (see Appendix G-59). There was a significant difference, however, on the discrepancy (see Appendix G-60). The mean ratings of goal 20 by program level are listed in Table 46. Results of the Duncan

Table 44

Mean Ratings of Goal 19 by Program Level

	Program Level		
Variable	Certificate[a]	Baccalaureate[b]	Masters[c]
Present obtainability			
M	5.414[d,e]	5.710[d]	4.704[e]
SD	1.338	1.488	2.053
Future importance			
M	6.397	6.548	6.481
SD	0.826	0.850	0.849
Discrepancy			
M	0.983[f]	0.838[f]	1.777[g]
SD	1.263	1.393	1.887

Note. Present obtainability means with different superscripts differ significantly at $p < .05$. Discrepancy means with different superscripts differ significantly at $p < .05$.
[a]$n = 58$. [b]$n = 31$. [c]$n = 27$.

Table 45

Percentages of Ratings on Goal 20 by C.R.N.A. Program Directors

Rating	Variable		
	Present obtainability[a]	Future importance[b]	Discrepancy[c]
7	38.3	61.2	-
6	24.3	19.8	0.9
5	12.2	12.1	2.6
4	7.0	6.0	3.5
3	12.2	0.9	8.7
2	4.3	-	11.3
1	1.7	-	13.0
0	-	-	52.2
-1	-	-	6.1
-2	-	-	1.7

Note. Dash indicates no data in cell.
[a] $N = 115$. [b] $N = 116$. [c] $N = 115$.

Table 46

Mean Ratings of Goal 20 by Program Level

	Program Level		
Variable	Certificate[a]	Baccalaureate[b]	Masters[c]
Present obtainability			
M	5.707	5.700	4.815
SD	1.427	1.535	2.113
Future importance			
M	6.362	6.323	6.333
SD	0.950	0.979	1.038
Discrepancy			
M	0.655[d]	0.600[d]	1.518[e]
SD	1.133	1.522	2.045

Note. Discrepancy means with different superscripts differ significantly at $p < .05$.
[a]$n = 58$. [b]$n = 31$ on future importance but $n = 30$ on other variables. [c]$n = 27$.

multiple range test at $p < .05$ indicated the mean discrepancy perceived by masters program directors was significantly different from the mean discrepancies of both certificate and baccalaureate program directors.

Goal 21. This goal addressed students acquiring knowledge of pharmacology in relation to anesthesia. The distribution of ratings by percentages is identified in Table 47.

Analysis of variance at $p < .05$ indicated no significant difference between ratings by program directors of certificate, baccalaureate, and masters programs on; present goal obtainability (see Appendix G-61), or on the future importance of the goal (see Appendix G-62). There was a significant difference, however, on the discrepancy (see Appendix G-63). The mean ratings of goal 21 by program level are listed in Table 48. Results of the Duncan multiple range test at $p < .05$ indicated there was a significant difference between the mean discrepancies perceived by masters and certificate program directors.

Goal 22. This goal addressed students acquiring knowledge of advanced physical assessment principles and techniques. The distribution of ratings by percentages is identified in Table 49.

Analysis of variance at $p < .05$ indicated no significant difference between ratings by program directors of certificate, baccalaureate, and masters programs on; present goal obtainability (see Appendix G-64), on the future importance of the goal (see Appendix G-65), or on the

Table 47

Percentages of Ratings on Goal 21 by C.R.N.A. Program Directors

	Variable		
Rating	Present obtainability[a]	Future importance[b]	Discrepancy[c]
7	55.2	93.1	-
6	23.2	5.2	0.9
5	11.2	-	0.9
4	5.2	1.7	1.7
3	2.6	-	4.3
2	1.7	-	12.1
1	0.9	-	21.6
0	-	-	58.6

Note. Dash indicates no data in cell.
[a,b,c] $N = 116$.

Table 48

Mean Ratings of Goal 21 by Program Level

	Program Level		
Variable	Certificate[a]	Baccalaureate[b]	Masters[c]
Present obtainability			
M	6.310	6.194	5.741
SD	1.127	1.046	1.655
Future importance			
M	6.879	6.871	6.963
SD	0.462	0.562	0.193
Discrepancy			
M	0.569[d]	0.677[d,e]	1.222[e]
SD	0.901	0.945	1.672

Note. Discrepancy means with different superscripts differ significantly at $p < .05$.
[a] $n = 58$. [b] $n = 31$. [c] $n = 27$.

Table 49

Percentages of Ratings on Goal 22 by C.R.N.A. Program Directors

Rating	Variable		
	Present obtainability[a]	Future importance[b]	Discrepancy[c]
7	22.6	67.2	-
6	13.0	20.7	2.6
5	16.5	9.5	7.0
4	17.4	1.7	8.7
3	15.7	-	13.9
2	10.4	0.9	22.6
1	4.3	-	17.4
0	-	-	27.8

Note. Dash indicates no data in cell.
[a]N = 115. [b]N = 116. [c]N = 115.

discrepancy (see Appendix G-66). The mean ratings of goal 22 by program level are listed in Table 50.

Goal 23. This goal addressed students presenting case discussions and journal articles to their peer group and the entire anesthesia department. The distribution of ratings by percentages is identified in Table 51.

Analysis of variance at $p < .05$ indicated no significant difference between ratings by program directors of certificate, baccalaureate, and masters programs on; present goal obtainability (see Appendix G-67), on the future importance of the goal (see Appendix G-68), or on the discrepancy (see Appendix G-69). The mean ratings of goal 23 by program level are listed in Table 52.

Goal 24. This goal addressed students completing theory and practice of Basic Cardiac Life Support, (B.C.L.S.). The distribution of ratings by percentages is identified in Table 53.

Analysis of variance at $p < .05$ indicated no significant difference between ratings by program directors of certificate, baccalaureate, and masters programs on; present goal obtainability (see Appendix G-70), on the future importance of the goal (see Appendix G-71), or on the discrepancy (see Appendix G-72). The mean ratings of goal 24 by program level are listed in Table 54.

Goal 25. This goal addressed students having preparation to participate in B.C.L.S. instruction within the hospital or in the community setting, i.e., students receiving

Table 50

Mean Ratings of Goal 22 by Program Level

	Program Level		
Variable	Certificate[a]	Baccalaureate[b]	Masters[c]
Present obtainability			
M	4.862	4.667	4.000
SD	1.721	1.882	1.922
Future importance			
M	6.517	6.645	6.333
SD	0.755	0.551	1.240
Discrepancy			
M	1.655	1.967	2.333
SD	1.528	1.712	1.922

[a] $n = 58$. [b] $n = 31$ on future importance but $n = 30$ on other variables. [c] $n = 27$.

Table 51

Percentages of Ratings on Goal 23 by C.R.N.A. Program Directors

Rating	Variable		
	Present obtainability[a]	Future importance[b]	Discrepancy[c]
7	33.6	57.8	-
6	12.1	24.1	1.7
5	19.0	10.3	3.4
4	17.2	6.9	6.0
3	5.2	0.9	6.9
2	10.3	-	18.1
1	2.6	-	17.2
0	-	-	44.0
-1	-	-	0.9
-2	-	-	0.9
-3	-	-	0.9

Note. Dash indicates no data in cell.
[a,b,c] $N = 116$.

Table 52

Mean Ratings of Goal 23 by Program Level

	Program Level		
Variable	Certificate[a]	Baccalaureate[b]	Masters[c]
Present obtainability			
M	5.155	5.323	4.741
SD	1.795	1.681	1.913
Future importance			
M	6.190	6.516	6.333
SD	1.034	0.851	0.961
Discrepancy			
M	1.035	1.193	1.592
SD	1.633	1.447	1.802

[a] $n = 58$. [b] $n = 31$. [c] $n = 27$.

Table 53

Percentages of Ratings on Goal 24 by C.R.N.A. Program Directors

Rating	Variable		
	Present obtainability[a]	Future importance[b]	Discrepancy[c]
7	64.7	74.1	-
6	16.4	8.6	1.7
5	4.3	9.5	0.9
4	4.3	3.4	2.6
3	5.2	-	0.9
2	2.6	0.9	2.6
1	2.6	3.4	10.3
0	-	-	75.9
-1	-	-	0.9
-2	-	-	1.7
-5	-	-	0.9
-6	-	-	1.7

Note. Dash indicates no data in cell.
[a,b,c] N = 116.

Table 54

Mean Ratings of Goal 24 by Program Level

	Program Level		
Variable	Certificate[a]	Baccalaureate[b]	Masters[c]
Present obtainability			
M	6.190	6.226	5.889
SD	1.457	1.384	1.908
Future importance			
M	6.414	6.323	6.333
SD	1.243	1.579	1.387
Discrepancy			
M	0.224	0.097	0.444
SD	1.338	1.972	1.476

[a] $n = 58$. [b] $n = 31$. [c] $n = 27$.

certification as B.C.L.S. instructors. The distribution of ratings by percentages is identified in Table 55.

Analysis of variance at $p < .05$ indicated no significant difference between ratings by program directors of certificate, baccalaureate, and masters programs on; present goal obtainability (see Appendix G-73), on future importance of the goal (see Appendix G-74), or on the discrepancy (see Appendix G-75). The mean ratings of goal 25 by program level are listed in Table 56.

Goal 26. This goal addressed students completing theory and practice of Advanced Cardiac Life Support (A.C.L.S.). The distribution of ratings by percentages is identified in Table 57.

Analysis of variance at $p < .05$ indicated no significant difference between ratings by program directors of certificate, baccalaureate, and masters programs on; present goal obtainability (see Appendix G-76), on the future importance of the goal (see Appendix G-77), or on the discrepancy (see Appendix G-78). The mean ratings of goal 26 by program level are listed in Table 58.

Goal 27. This goal addressed students acquiring knowledge of principles of practice of general anesthesia. The distribution of ratings by percentages is identified in Table 59.

Analysis of variance at $p < .05$ indicated no significant difference between ratings by program directors of certificate, baccalaureate, and masters programs on; present

Table 55

Percentages of Ratings on Goal 25 by C.R.N.A. Program Directors

Rating	Variable		
	Present obtainability[a]	Future importance[b]	Discrepancy[c]
7	12.9	40.5	-
6	6.0	12.9	10.3
5	12.1	16.4	3.4
4	12.1	14.7	12.1
3	13.8	6.0	11.2
2	14.7	2.6	17.2
1	28.4	6.9	11.2
0	-	-	30.2
-1	-	-	2.6
-2	-	-	0.9
-6	-	-	0.9

Note. Dash indicates no data in cell.
[a,b,c] N = 116.

Table 56

Mean Ratings of Goal 25 by Program Level

	Program Level		
Variable	Certificate[a]	Baccalaureate[b]	Masters[c]
Present obtainability			
M	3.414	3.387	3.148
SD	2.128	2.201	1.994
Future importance			
M	5.328	5.032	5.630
SD	1.761	2.168	1.621
Discrepancy			
M	1.914	1.645	2.482
SD	1.940	2.443	2.424

[a] $n = 58$. [b] $n = 31$. [c] $n = 27$.

Table 57

Percentages of Ratings on Goal 26 by C.R.N.A. Program Directors

Rating	Variable		
	Present obtainability[a]	Future importance[b]	Discrepancy[c]
7	18.1	51.7	-
6	6.0	18.1	16.4
5	5.2	17.2	10.3
4	10.3	6.0	12.1
3	10.3	1.7	13.8
2	12.1	1.7	12.1
1	37.9	3.4	6.9
0	-	-	27.6
-1	-	-	0.9

Note. Dash indicates no data in cell.
[a,b,c] $N = 116$.

Table 58

Mean Ratings of Goal 26 by Program Level

	Program Level		
Variable	Certificate[a]	Baccalaureate[b]	Masters[c]
Present obtainability			
M	3.293	3.419	2.889
SD	2.325	2.553	2.063
Future importance			
M	5.879	6.065	5.889
SD	1.464	1.590	1.502
Discrepancy			
M	2.586	2.646	3.000
SD	2.185	2.288	2.321

[a] $n = 58$. [b] $n = 31$. [c] $n = 27$.

Table 59

Percentages of Ratings on Goal 27 by C.R.N.A. Program Directors

Rating	Variable		
	Present obtainability[a]	Future importance[b]	Discrepancy[c]
7	65.5	92.2	-
6	18.1	6.1	1.7
5	7.8	1.7	-
4	6.9	-	-
3	-	-	4.3
2	-	-	5.2
1	1.7	-	21.7
0	-	-	67.0

Note. Dash indicates no data in cell.
[a] $N = 116$. [b,c] $N = 115$.

goal obtainability (see Appendix G-79), or on the future importance of the goal (see Appendix G-80). There was a significant difference, however, on the discrepancy (see Appendix G-81). The mean ratings of goal 27 by program level are listed in Table 60. Results of the Duncan multiple range test at $p < .05$ indicated there was a significant difference between the mean discrepancies perceived by certificate and masters program directors.

Goal 28. This goal addressed students acquiring knowledge of the anesthetic management of patients under regional anesthesia. The distribution of ratings by percentages is identified in Table 61.

Analysis of variance at $p < .05$ indicated no significant difference between the ratings by program directors of certificate, baccalaureate, and masters programs on; present goal obtainability (see Appendix G-82), on the future importance of the goal (see Appendix G-83), or on the discrepancy (see Appendix G-84). The mean ratings of goal 28 by program level are listed in Table 62.

Goal 29. This goal addressed students acquiring knowledge of principles and techniques of administering regional anesthesia. The distribution of ratings by percentages is identified in Table 63.

Analysis of variance at $p < .05$ indicated no significant difference between the ratings by program directors of certificate, baccalaureate, and masters programs on; present goal obtainability (see Appendix G-85) on the future

Table 60

Mean Ratings of Goal 27 by Program Level

	Program Level		
Variable	Certificate[a]	Baccalaureate[b]	Masters[c]
Present obtainability			
M	6.569	6.323	5.926
SD	0.881	1.166	1.517
Future importance			
M	6.897	6.871	6.962
SD	0.360	0.428	0.196
Discrepancy			
M	0.328[d]	0.548[d,e]	1.076[e]
SD	0.659	1.121	1.521

Note. Discrepancy means with different superscripts differ significantly at $p < .05$.
[a]$n = 58$. [b]$n = 31$. [c]$n = 27$ on present obtainability but $n = 26$ on other variables.

Table 61

Percentages of Ratings on Goal 28 by C.R.N.A. Program Directors

	Variable		
Rating	Present obtainability[a]	Future importance[b]	Discrepancy[c]
7	46.6	84.5	-
6	18.1	12.9	3.4
5	15.5	1.7	0.9
4	9.5	0.9	4.3
3	3.4	-	8.6
2	3.4	0	14.7
1	3.4	0	13.8
0	-	-	53.4
-1	-	-	0.9

Note. Dash indicates no data in cell.
[a,b,c] $N = 116$.

Table 62

Mean Ratings of Goal 28 by Program Level

	Program Level		
Variable	Certificate[a]	Baccalaureate[b]	Masters[c]
Present obtainability			
M	5.914	5,387	5.630
SD	1.467	1.944	1.573
Future importance			
M	6.759	6.807	6.926
SD	0.602	0.402	0.267
Discrepancy			
M	0.845	1.420	1.296
SD	1.348	1.858	1.613

[a] $n = 58$. [b] $n = 31$. [c] $n = 27$.

Table 63

Percentages of Ratings on Goal 29 by C.R.N.A. Program Directors

	Variable		
Rating	Present obtainability[a]	Future importance[b]	Discrepancy[c]
7	20.9	73.9	-
6	10.4	17.4	14.8
5	16.5	7.0	8.7
4	9.6	0.9	13.0
3	10.4	-	9.6
2	13.0	-	14.8
1	19.1	0.9	13.9
0	-	-	24.3
-1	-	-	0.9

Note. Dash indicates no data in cell.
[a,b,c] $N = 115$.

importance of the goal (see Appendix G-86), or on the discrepancy (see Appendix G-87). The mean ratings of goal 29 by program level are listed in Table 64.

Goal 30. This goal addressed students acquiring knowledge of principles and techniques of respiratory care. The distribution of ratings by percentages is identified in Table 65.

Analysis of variance at $p < .05$ indicated no significant difference between the ratings by program directors of certificate, baccalaureate and masters programs on; present goal obtainability (see Appendix G-88), on the future importance of the goal (see Appendix G-89), or on the discrepancy (see Appendix G-90). The mean ratings of goal 30 by program level are listed in Table 66.

Goal 31. This goal addressed students acquiring knowledge of the fundamentals of statistics. The distribution of ratings by percentages is identified in Table 67.

Analysis of variance at $p < .05$ indicated a significant difference between the ratings by program directors of certificate, baccalaureate, and masters programs on; present goal obtainability (see Appendix G-91), and a significant difference at $p < .01$ on the future importance of the goal (see Appendix 92). There was no significant difference, however, on the discrepancy (see Appendix G-93). The mean ratings of goal 31 by program level are listed in Table 68. Results of the Duncan multiple range test at $p < .05$ indicated the mean rating of present goal obtainability by

Table 64

Mean Ratings of Goal 29 by Program Level

	Program Level		
Variable	Certificate[a]	Baccalaureate[b]	Masters[c]
Present obtainability			
M	4.069	3.933	4.185
SD	2.270	2.083	2.254
Future importance			
M	6.517	6.633	6.778
SD	0.996	0.669	0.578
Discrepancy			
M	2.448	2.700	2.593
SD	2.234	2.003	2.325

[a] $n = 58$. [b] $n = 30$. [c] $n = 27$.

Table 65

Percentages of Ratings on Goal 30 by C.R.N.A. Program Directors

Rating	Variable		
	Present obtainability[a]	Future importance[b]	Discrepancy[c]
7	22.4	46.1	-
6	12.1	21.7	2.6
5	24.1	17.4	1.7
4	17.2	8.7	5.2
3	12.1	4.3	8.7
2	7.8	0.9	15.7
1	4.3	0.9	21.7
0	-	-	40.0
-1	-	-	1.7
-2	-	-	2.6

Note. Dash indicates no data in cell.
[a]N = 116. [b,c]N = 115.

Table 66

Mean Ratings of Goal 30 by Program Level

	Program Level		
Variable	Certificate[a]	Baccalaureate[b]	Masters[c]
Present obtainability			
M	4.759	4.807	4.667
SD	1.750	1.740	1.776
Future importance			
M	5.825	6.000	5.963
SD	1.364	1.390	1.160
Discrepancy			
M	1.105	1.193	1.296
SD	1.435	1.662	1.938

[a] n = 58 on present obtainability but n = 57 on other variables. [b] n = 31. [c] n = 27.

Table 67

Percentages of Ratings on Goal 31 by C.R.N.A. Program Directors

Rating	Variable		
	Present obtainability[a]	Future importance[b]	Discrepancy[c]
7	4.3	20.9	-
6	2.6	20.9	9.6
5	7.0	20.9	5.2
4	13.0	19.1	12.2
3	8.7	12.2	23.5
2	16.5	1.7	22.6
1	47.8	4.3	8.7
0	-	-	18.3

Note. Dash indicates no data in cell.
[a,b,c] N = 115.

Table 68

Mean Ratings of Goal 31 by Program Level

	Program Level		
Variable	Certificate[a]	Baccalaureate[b]	Masters[c]
Present obtainability			
M	1.931[d]	2.700[e]	3.074[e]
SD	1.349	1.860	2.147
Future importance			
M	4.500[f]	5.100[f,g]	5.815[g]
SD	1.548	1.626	1.388
Discrepancy			
M	2.569	2.400	2.741
SD	1.697	1.673	2.177

Note. Present obtainability means with different superscripts differ significantly at $p < .05$. Future importance means with different superscripts differ significantly at $p < .05$.
[a]$n = 58$. [b]$n = 30$. [c]$n = 27$.

certificate program directors was significantly different from the mean ratings of both baccalaureate and masters program directors. On the ratings of future importance of the goal the Duncan multiple range test at $p < .05$ indicated there was a significant difference between the mean ratings of certificate and masters program directors.

Goal 32. This goal addressed students acquiring knowledge in research methodologies. The distribution of ratings by percentages is identified in Table 69.

Analysis of variance at $p < .05$ indicated no significant difference between ratings by program directors of certificate, baccalaureate, and masters programs on; present goal obtainability (see Appendix G-94). Their ratings on the future importance of the goal were significantly different at $p < .01$ (see Appendix G-95), however, there was no significant difference on the discrepancy (see Appendix G-96). The mean ratings of goal 32 by program level are listed in Table 70. Results of the Duncan multiple range test at $p < .05$ indicated the mean ratings on future importance of the goal were significantly different between directors of certificate and masters programs.

Goal 33. This goal addressed students analyzing anesthesia research articles in regards to statistical analysis and methodologies used. The distribution of ratings by percentages is identified in Table 71.

Analysis of variance at $p < .05$ indicated a significant difference between the ratings by program directors of

Table 69

Percentages of Ratings on Goal 32 by C.R.N.A. Program Directors

	Variable		
Rating	Present obtainability[a]	Future importance[b]	Discrepancy[c]
7	4.4	27.0	-
6	3.5	27.8	10.5
5	8.8	17.4	12.3
4	14.0	12.2	11.4
3	7.0	8.7	19.3
2	17.5	2.6	16.7
1	44.7	4.3	11.4
0	-	-	18.4

Note. Dash indicates no data in cell.
[a]N = 114. [b]N = 115. [c]N = 114.

Table 70

Mean Ratings of Goal 32 by Program Level

	Program Level		
Variable	Certificate[a]	Baccalaureate[b]	Masters[c]
Present obtainability			
M	2.211	2.677	3.039
SD	1.544	1.740	2.306
Future importance			
M	4.860[d]	5.387[d,e]	6.000[e]
SD	1.620	1.687	1.414
Discrepancy			
M	2.649	2.710	2.923
SD	1.885	1.755	2.331

Note. Future importance means with different superscripts differ significantly at $p < .05$.
[a]$n = 57$. [b]$n = 31$. [c]$n = 27$ on future importance but $n = 26$ on other variables.

Table 71

Percentages of Ratings on Goal 33 by C.R.N.A. Program Directors

Rating	Variable		
	Present obtainability[a]	Future importance[b]	Discrepancy[c]
7	4.3	27.6	-
6	5.2	28.4	9.6
5	10.4	13.8	8.7
4	15.7	12.1	11.3
3	7.0	8.6	14.8
2	21.7	6.9	23.5
1	35.7	2.6	8.7
0	-	-	22.6
-1	-	-	0.9

Note. Dash indicates no data in cell.
[a] $N = 115$. [b] $N = 116$. [c] $N = 115$.

certificate, baccalaureate, and masters programs on; present goal obtainability (see Appendix G-97), and a significant difference at $p < .01$ on the future importance of the goal (see Appendix G-98). There was no significant difference, however, on the discrepancy (see Appendix G-99). The mean ratings of goal 33 by program level are listed in Table 72. Results of the Duncan multiple range test at $p < .05$ indicated the mean ratings on present goal obtainability and on the future importance of the goal were significantly different between certificate and masters program directors.

Goal 34. This goal addressed students writing a clinical or research paper. The distribution of ratings by percentages is identified in Table 73.

Analysis of variance at $p < .05$ indicated no significant difference in the ratings by program directors of certificate, baccalaureate, or masters programs on; present goal obtainability (see Appendix G-100). There was a significant difference on their ratings of future importance of the goal (see Appendix G-101), however, there was no significant difference on the discrepancy (see Appendix G-102). The mean ratings on goal 34 are listed in Table 74. Results of the Duncan multiple range test at $p < .05$ indicated a significant difference between the mean ratings of certificate and masters program directors on the future importance of the goal.

Goal 35. This goal addressed students developing a proposal for a research project. The distribution of

Table 72

Mean Ratings of Goal 33 by Program Level

	Program Level		
Variable	Certificate[a]	Baccalaureate[b]	Masters[c]
Present obtainability			
M	2.328[d]	2.936[d,e]	3.539[e]
SD	1.594	1.825	2.102
Future importance			
M	4.845[f]	5.226[f,g]	6.074[g]
SD	1.745	1.746	1.174
Discrepancy			
M	2.517	2.290	2.500
SD	1.939	1.883	2.121

Note. Present goal obtainability means with different superscripts differ significantly at $p < .05$. Future importance means with different superscripts differ significantly at $p < .05$.
[a]$n = 58$. [b]$n = 31$. [c]$n = 27$ on future importance but $n = 26$ on other variables.

Table 73

Percentages of Ratings on Goal 34 by C.R.N.A. Program Directors

Rating	Variable		
	Present obtainability[a]	Future importance[b]	Discrepancy[c]
7	19.8	42.2	-
6	6.9	23.3	10.3
5	10.3	14.7	6.0
4	12.9	10.3	12.9
3	9.5	5.2	11.2
2	7.8	1.7	14.7
1	32.8	2.6	7.8
0	-	-	34.5
-1	-	-	1.7
-2	-	-	0.9

Note. Dash indicates no data in cell.
[a,b,c] $N = 116$.

Table 74

Mean Ratings of Goal 34 by Program Level

	Program Level		
Variable	Certificate[a]	Baccalaureate[b]	Masters[c]
Present obtainability			
M	3.241	4.258	3.630
SD	2.242	2.265	2.483
Future importance			
M	5.345[d]	5.968[d,e]	6.222[e]
SD	1.562	1.278	1.423
Discrepancy			
M	2.104	1.710	2.592
SD	2.091	1.883	2.500

Note. Future importance means with different superscripts differ significantly at $p < .05$.
[a]$n = 58$. [b]$n = 31$. [c]$n = 27$.

ratings by percentages is identified in Table 75.

Analysis of variance at $p < .05$ indicated a significant difference between the ratings by program directors of certificate, baccaluareate, and masters programs on; present goal obtainability (see Appendix G-103), and a significant difference at $p < .01$ on the future importance of the goal (see Appendix G-104). There was no significant difference on the discrepancy (see Appendix G-105). The mean ratings of goal 35 by program level are listed in Table 76. Results of the Duncan multiple range test at $p < .05$ indicated a significant difference between the mean rating of present goal obtainability by certificate program directors and the mean ratings of both baccaluareate and masters program directors. On the future importance of the goal ratings were significantly different between certificate and masters program directors.

Goal 36. This goal addressed students implementing a research proposal. The distribution of ratings by percentages is identified in Table 77.

Analysis of variance at $p < .05$ indicated a significant difference between ratings by program directors of certificate, baccalaureate, and masters programs on; present goal obtainability (see Appendix G-106), and a significant difference at $p < .01$ on the future importance of the goal (see Appendix G-107). There was no significant difference on the discrepancy (see Appendix G-108). The mean ratings of goal 36 by program level are listed in Table 78.

Table 75

Percentages of Ratings on Goal 35 by C.R.N.A. Program Directors

	Variable		
Rating	Present obtainability[a]	Future importance[b]	Discrepancy[c]
7	11.3	35.7	-
6	6.1	18.3	11.4
5	7.8	12.2	7.0
4	6.1	17.4	13.2
3	8.7	5.2	18.4
2	12.2	6.1	11.4
1	47.8	5.2	12.3
0	-	-	25.4
-2	-	-	0.9

Note. Dash indicates no data in cell.
[a,b] N = 115. [c] N = 114.

Table 76

Mean Ratings of Goal 35 by Program Level

	Program Level		
Variable	Certificate[a]	Baccalaureate[b]	Masters[c]
Present obtainability			
M	2.241[d]	3.323[e]	3.308[e]
SD	1.867	2.315	2.446
Future importance			
M	4.724[f]	5.400[f,g]	6.111[g]
SD	1.785	1.905	1.502
Discrepancy			
M	2.483	2.077	2.769
SD	1.949	1.845	2.550

Note. Present obtainability means with different superscripts differ significantly at $p < .05$. Future importance means with different superscripts differ significantly at $p < .05$.
[a]$n = 58$. [b]$n = 31$ on present obtainability but $n = 30$ on other variables. [c]$n = 27$ on future importance but $n = 26$ on other variables.

Table 77

Percentages of Ratings on Goal 36 by C.R.N.A. Program Directors

Rating	Variable		
	Present obtainability[a]	Future importance[b]	Discrepancy[c]
7	9.6	30.4	-
6	4.3	21.7	8.8
5	7.8	12.2	12.3
4	7.0	17.4	11.4
3	7.0	5.2	17.5
2	11.3	4.3	14.0
1	53.0	8.7	10.5
0	-	-	24.6
-1	-	-	0.9

Note. Dash indicates no data in cell.
[a,b] N = 115. [c] N = 114.

Table 78

Mean Ratings of Goal 36 by Program Level

	Program Level		
Variable	Certificate[a]	Baccalaureate[b]	Masters[c]
Present obtainability			
M	2.069[d]	2.936[d,e]	3.231[e]
SD	1.824	2.144	2.388
Future importance			
M	4.586[f]	5.100[f]	6.074[g]
SD	1.855	2.023	1.492
Discrepancy			
M	2.517	2.200	2.808
SD	1.940	1.846	2.400

Note. Present obtainability means with different superscripts differ significantly at $p < .05$. Future importance means with different superscripts differ significantly at $p < .05$. [a]$n = 58$. [b]$n = 31$ on present obtainability but $n = 30$ on other variables. [c]$n = 27$ on future importance but $n = 26$ on other variables.

Results of the Duncan multiple range test at $p < .05$ indicated a significant difference between the mean ratings of certificate and masters program directors on present goal obtainability. On the future importance of the goal the mean rating of masters program directors was significantly different from the mean ratings of both certificate and baccalaureate program directors.

Goal 37. This goal addressed students acquiring knowledge in staff relations with other professional groups. The distribution of ratings by percentages is identified in Table 79.

Analysis of variance at $p < .05$ indicated no significant difference between ratings by program directors of certificate, baccalaureate, and masters programs on; present goal obtainability (see Appendix G-109), on the future importance of the goal (see Appendix G-110), or on the discrepancy (see Appendix G-111). The mean ratings of goal 37 by program level are listed in Table 80.

Goal 38. This goal addressed students acquiring knowledge in curriculum, instruction, and evaluation. The distribution of ratings by percentages is identified in Table 81.

Analysis of variance at $p < .05$ indicated no significant difference between ratings by program directors of certificate, baccalaureate, and masters programs on; present goal obtainability (see Appendix G-112), on the future importance of the goal (see Appendix G-113), or on the

Table 79

Percentages of Ratings on Goal 37 by C.R.N.A. Program Directors

	Variable		
Rating	Present obtainability[a]	Future importance[b]	Discrepancy[c]
7	19.1	42.6	-
6	13.9	23.5	2.6
5	9.6	16.5	5.2
4	19.1	13.0	7.8
3	13.0	2.6	13.9
2	12.2	1.7	18.3
1	13.0	-	15.7
0	-	-	36.5

Note. Dash indicates no data in cell.
[a,b,c] $N = 115$.

Table 80

Mean Ratings of Goal 37 by Program Level

	Program Level		
Variable	Certificate[a]	Baccalaureate[b]	Masters[c]
Present obtainability			
M	4.138	4.389	4.039
SD	1.969	2.201	2.068
Future importance			
M	5.621	6.000	6.192
SD	1.399	1.317	0.749
Discrepancy			
M	1.483	1.613	2.153
SD	1.513	1.726	1.994

[a] $n = 58$. [b] $n = 31$. [c] $n = 26$.

Table 81

Percentages of Ratings on Goal 38 by C.R.N.A. Program Directors

Rating	Variable		
	Present obtainability[a]	Future importance[b]	Discrepancy[c]
7	3.5	23.5	-
6	3.5	13.9	9.6
5	5.2	25.2	6.1
4	11.3	16.5	16.5
3	10.4	8.7	17.4
2	20.9	5.2	17.4
1	45.2	7.0	10.4
0	-	-	21.7
-3	-	-	0.9

Note. Dash indicates no data in cell.
[a,b,c] $N = 115$.

discrepancy (see Appendix G-114). The mean ratings of goal 38 by program level are listed in Table 82.

Goal 39. This goal addressed students participating in supervised practice teaching. The distribution of ratings by percentage is identified in Table 83.

Analysis of variance at $p < .05$ indicated no significant difference between ratings by program directors of certificate, baccalaureate and masters programs on; present goal obtainability (see Appendix G-115), however, there was a significant difference on the future importance of the goal (see Appendix G-116). There was no significant difference on the discrepancy (see Appendix G-117). The mean ratings of goal 39 by program level are listed in Table 84. Results of the Duncan multiple range test at $p < .05$ indicated the mean rating of certificate program directors was significantly different from the mean ratings of both baccaluareate and masters program directors on the future importance of the goal.

Goal 40. This goal addressed students acquiring knowledge of interpretations of electrocardiograms. The distribution of ratings by percentages is identified in Table 85.

Analysis of variance at $p < .05$ indicated no significant difference between ratings by program directors of certificate, baccalaureate, and masters programs on; present goal obtainability (see Appendix G-118) or on the future importance of the goal (see Appendix G-119). There was a significant difference, however, on the discrepancy (see

Table 82

Mean Ratings of Goal 38 by Program Level

	Program Level		
Variable	Certificate[a]	Baccalaureate[b]	Masters[c]
Present obtainability			
M	2.069	2.867	2.370
SD	1.362	1.961	1.864
Future importance			
M	4.483	5.300	5.074
SD	1.857	1.745	1.542
Discrepancy			
M	2.414	2.433	2.704
SD	1.855	2.144	2.091

[a] $n = 58$. [b] $n = 30$. [c] $n = 27$.

Table 83

Percentages of Ratings on Goal 39 by C.R.N.A. Program Directors

Rating	Variable		
	Present obtainability[a]	Future importance[b]	Discrepancy[c]
7	6.9	24.1	-
6	2.6	12.9	6.1
5	6.9	23.3	7.0
4	10.3	19.0	13.2
3	10.3	6.9	18.4
2	19.8	6.0	17.5
1	43.1	6.0	18.4
0	-	-	19.3

Note. Dash indicates no data in cell.
[a] $N = 116$. [b,c] $N = 114$.

Table 84

Mean Ratings of Goal 39 by Program Level

	Program Level		
Variable	Certificate[a]	Baccalaureate[b]	Masters[c]
Present obtainability			
M	2.224	2.936	2.741
SD	1.738	2.032	1.852
Future importance			
M	4.448[d]	5.233[e]	5.346[e]
SD	1.798	1.736	1.573
Discrepancy			
M	2.224	2.333	2.577
SD	1.655	1.882	2.003

Note. Future importance means with different superscripts differ significantly at $p < .05$.
[a]$n = 58$. [b]$n = 31$ on present obtainability but $n = 30$ on other variables. [c]$n = 27$ on present obtainability but $n = 30$ on other variables.

Table 85

Percentages of Ratings on Goal 40 by C.R.N.A. Program Directors

Rating	Variable		
	Present obtainability[a]	Future importance[b]	Discrepancy[c]
7	36.0	73.3	-
6	16.7	18.1	2.6
5	16.7	3.4	5.3
4	9.6	2.6	7.9
3	10.5	0.9	6.1
2	3.5	-	15.8
1	7.0	1.7	18.4
0	-	-	40.4
-1	-	-	1.8
-2	-	-	0.9
-6	-	-	0.9

Note. Dash indicates no data in cell.
[a] $N = 114$. [b] $N = 116$. [c] $N = 114$.

Appendix G-120). The mean ratings of goal 40 by program level are listed in Table 86. Results of the Duncan multiple range test at $p < .05$ indicated there was a significant difference in the discrepancies perceived by directors of certificate and masters programs.

Goal 41. This goal addressed students acquiring knowledge of principles and techniques of advanced monitoring modalities. The distribution of ratings by percentages is identified in Table 87.

Analysis of variance at $p < .05$ indicated no significant difference between ratings by program directors of certificate, baccalaureate, and masters programs on; present goal obtainability (see Appendix G-121), on the future importance of the goal (see Appendix G-122), or on the discrepancy (see Appendix G-123). The mean ratings of goal 41 by program level are listed in Table 88.

Correlations of Ratings

Pearson product-moment correlation coefficients were computed to analyze the strength of the relationships between ratings by certificate, baccalaureate, and masters program directors on; present goal obtainability, on the future importance of the goal, and on the discrepancy.

Present Goal Obtainability. The mean ratings by each program level were correlated. The correlation matrix for ratings on present goal obtainability is illustrated in Table 89.

Table 86

Mean Ratings of Goal 40 by Program Level

	Program Level		
Variable	Certificate[a]	Baccalaureate[b]	Masters[c]
Present obtainability			
M	5.500	5.233	4.462
SD	1.770	2.029	1.838
Future importance			
M	6.466	6.645	6.556
SD	1.096	1.112	0.892
Discrepancy			
M	0.966[d]	1.400[d,e]	2.077[e]
SD	1.486	2.358	1.875

Note. Discrepancy means with different superscripts differ significantly at $p < .05$.
[a]$n = 58$. [b]$n = 31$ on future importance but $n = 30$ on other variables. [c]$n = 27$ on future importance but $n = 26$ on other variables.

Table 87

Percentages of Ratings on Goal 41 by C.R.N.A. Program Directors

Rating	Variable		
	Present obtainability[a]	Future importance[b]	Discrepancy[c]
7	36.2	75.7	-
6	14.7	18.3	3.5
5	13.8	3.5	7.8
4	12.1	0.9	7.0
3	11.2	0.9	10.4
2	6.0	-	10.4
1	6.0	0.9	18.3
0	-	-	41.7
-6	-	-	0.9

Note. Dash indicates no data in cell.
[a]N = 116. [b,c]N = 115.

Table 88

Mean Ratings of Goal 41 by Program Level

	Program Level		
Variable	Certificate[a]	Baccalaureate[b]	Masters[c]
Present obtainability			
M	5.414	4.903	4.667
SD	1.855	2.022	1.901
Future importance			
M	6.667	6.548	6.667
SD	0.787	1.121	0.620
Discrepancy			
M	1.246	1.645	2.000
SD	1.735	2.317	1.907

[a] $n = 58$ on present obtainability but $n = 57$ on other variables. [b] $n = 31$. [c] $n = 27$.

Table 89

Correlations of Present Goal Obtainability Ratings Between Program Levels

Program level	Certificate	Baccalaureate	Masters
Certificate	-	.97*	.92*
Baccalaureate		-	.91*
Masters			-

Note. N = 41.
*p < .001.

Future Importance of Goal. The mean ratings by each program level were correlated. The correlation matrix for ratings on the future importance of the goals is illustrated in Table 90.

Table 90

Correlations of Future Importance of Goal Ratings Between Program Levels

Program level	Certificate	Baccalaureate	Masters
Certificate	-	.94*	.75*
Baccalaureate		-	.80*
Masters			-

Note. N = 41.
*p < .001.

Discrepancy. The mean discrepancies perceived by each program level were correlated. The correlation matrix for the discrepancies is illustrated in Table 91.

Table 91.

Correlations of Discrepancies Between Program Levels

Program level	Certificate	Baccalaureate	Masters
Certificate	-	.93*	.92*
Baccalaureate		-	.91*
Masters			-

Note. N = 41.
*p < .001.

Summary of Data Analysis

The statistical analysis of data provided empirical information regarding the research questions of this study. Findings are discussed as they pertain to each research question.

Research Question I. Is there a discrepancy perceived by C.R.N.A. program directors on the level of goal obtainability with current minimum academic requirements of generic nurse anesthesia programs and the importance of those goals at the time students enter all nurse anesthesia programs holding a baccalaureate degree?

The results of data analysis domonstrated that a discrepancy was perceived on each of the 41 educational goals

evaluated in this study. The mean discrepancy perceived on each goal by C.R.N.A. program directors provided quantitative data to prioritize areas needing change in the academic curriculum. Educational goals ranked by their mean discrepancies are in Appendix H.

Research Question II. Is there a significant difference between the perceptions of C.R.N.A. program directors of certificate programs, baccalaureate level programs, and masters level programs regarding the level of goal obtainability with the current minimum academic requirements of generic nurse anesthesia programs?

Ratings on present goal obtainability were significantly different between certificate, baccalaureate, and masters program directors on seven of the educational goals in this study. On four goals which addressed research, i.e., fundamentals of statistics, analyzing research articles, and developing and implementing a research proposal, certificate program directors rated present goal obtainability significantly lower than either masters program directors or both masters and baccalaureate program directors. Masters program directors rated biochemistry significantly lower than baccalaureate program directors on present goal obtainability. On the goal pertaining to general, organic, and inorganic chemistry; and the goal pertaining to anatomy, physiology, and pathophysiology, the present goal obtainability ratings by masters program directors were significantly lower than both certificate and baccalaureate

program directors.

Research Question III. Is there a significant difference between the perceptions of C.R.N.A. program directors of certificate programs, baccalaureate level programs, and masters level programs regarding the importance of goals at the time students enter all nurse anesthesia programs holding a baccalaureate degree?

Ratings on future importance of the goal were significantly different between certificate, baccalaureate, and masters program directors on seven of the educational goals in this study. On six goals which addressed research; i.e. fundamental statistics, research methodology, analyzing research articles, writing a clinical or research paper, developing and implementing a research proposal, certificate program directors rated future importance of the goal significantly lower than masters program directors. On the goal addressing implementing a research proposal, ratings by baccalaureate program directors were also significantly lower than masters program directors. The seventh goal with a significant difference on future importance addressed students participating in supervised teaching. Certificate program directors rated this goal significantly lower than both baccalaureate and masters program directors.

Research Question IV. Is there a significant difference between the perceptions of C.R.N.A. program directors of certificate programs, baccalaureate level programs, and masters level programs regarding the discrepancy between the

level of goal obtainability with the current minimum academic requirements of generic nurse anesthesia programs and the importance of those goals at the time students enter all nurse anesthesia programs holding a baccalaureate degree?

The discrepancies perceived by certificate, baccalaureate, and masters program directors were significantly different on nine of the educational goals in this study. On all nine of these goals the discrepancies perceived by masters program directors were significantly larger than either certificate program directors, baccalaureate program directors, or both. On the goals pertaining to ethics; anatomy, physiology, and pathophysiology; general, organic, and inorganic chemistry; biochemistry, and physics the discrepancies perceived by masters program directors were significantly larger than both certificate and baccalaureate program directors. On the goals pertaining to pharmacolgoy, principles of general anesthesia, and electrocardiogram interpretation the discrepancies perceived by masters program directors were significantly larger than certificate program directors. And finally, on the goal pertaining to the history, purposes and functions of the Councils, the masters program directors perceived a significantly larger discrepancy than baccalaureate program directors.

On the goals where significantly different discrepancies were perceived, not one of the goals had a significant difference on ratings of future importance of the goal, however, three were rated significantly different on present

goal obtainability. On all nine goals the masters program directors had the lowest mean rating on present goal obtainability and the highest mean rating on future importance of the goal.

Research Question V. Are there significant correlations between the perceptions of C.R.N.A. program directors of certificate programs, baccalaureate level programs, and masters level programs regarding the level of goal obtainability with the current minimum academic requirements of generic nurse anesthesia programs?

The Pearson product-moment correlation coefficients obtained by correlating the mean present goal obtainability ratings by certificate, baccalaureate, and masters program directors demonstrated significant positive correlations between C.R.N.A. directors of all program levels.

Research Question VI. Are there significant correlations between the perceptions of C.R.N.A. program directors of certificate programs, baccalaureate level programs, and masters level programs regarding the importance of goals at the time students enter all nurse anesthesia programs holding a baccalaureate degree?

The Pearson product-moment correlation coefficients obtained by correlating the mean future importance of goal ratings by certificate, baccalaureate, and masters program directors demonstrated significant positive correlations between C.R.N.A. directors of all program levels. These coefficients were somewhat lower than those obtained for

present goal obtainability ratings. This may be explained by the fact that, of the goals with a significant difference on ratings of future importance, five out of seven were significantly different at $p < .01$. None of the present goal obtainability ratings were significantly different at a probability level lower than $p < .05$.

Research Question VII. Are there significant correlations between the perceptions of C.R.N.A. program directors of certificate programs, baccalaureate level programs, and masters level programs regarding the discrepancy between the level of goal obtainability with the current minimum academic requirements of generic nurse anesthesia programs and the importance of thos goals at the time students enter all nurse anesthesia programs holding a baccalaureate degree?

The Pearson product-moment correlation coefficients obtained by correlating the mean discrepancies perceived by certificate, baccalaureate, and masters program directors demonstrated significant positive correlations between C.R.N.A. directors of all program levels.

Research Question VIII. Is the technique of discrepancy evaluation a feasible method to evaluate an educational curriculum?

The data obtained by using the discrepancy evaluation technique has identified educational goals which C.R.N.A. program directors believe are important in the future (see Appendix I), as well as the discrepancies they perceive on these educational goals. This information provides

empirical data to decision makers regarding the perceptions of key individuals involved in the educational process.

As the results of this study demonstrate, however, it is essential to analyze the data further than merely performing a discrepancy analysis. If there are significant differences between groups' ratings of the goals, it behooves decision makers to be aware of these differences before making changes in academic requirements. It is also important to be cognizant of whether the differences in discrepancies perceived are due to ratings of present goal obtainability or ratings of future importance of the goal. If program directors have similar beliefs regarding the future importance of a goal, but differ significantly on their ratings of present obtainability, it may be due to ambiguity of the standards by which the goals are evaluated. This would support Steinmetz's (1967) identification of intangible or ambiguous educational goals or standards as factors which may hinder the perceptions of discrepancies.

Chapter 5

Summary, Conclusions, and Recommendations

This chapter provides a summary of the research including the statement of the research problem and a description of the methodology. Conclusions based on the findings of this study are presented. Recommendations are discussed and implications for further research are addressed.

Summary

The research problem this study investigated is: First, is there a discrepancy perceived between educational goals that are currently met by the minimum academic requirements of the Council and the importance of goals being met in the future when a baccalaureate degree is required as an entry requirement for all nurse anesthesia programs? Second, can the employment of a discrepancy evaluation technique supply a quantitative data base to assist decision makers in developing future academic curriculum requirements in nurse anesthesia educational programs?

The theoretical framework of this study considers education a dynamic process consisting of inputs, processes, and outputs. Provus' (1971) discrepancy evaluation model provides a mechanism to evaluate these components by comparing a performance to a standard, or comparing "what is" to "what should be", and determining the discrepancy that exists. The empirical data that result provide quantitative information upon which curriculum decisions can be made.

This study utilized the discrepancy analysis technique

to evaluate educational goals for the nursing specialty of anesthesia. C.R.N.A. program directors evaluated 41 educational goals based on the extent they believed the goals were met by the minimum academic requirements of the Council on Accreditation, and the extent they believed the goals should be met in the future when students will enter all nurse anesthesia programs with a baccalaureate degree. In addition to the discrepancy analysis, the research design stratified the C.R.N.A. program director population into those who directed certificate programs, baccalaureate programs, and masters programs to facilitate analysis of variance between the three groups. The entire population was included in the study.

The data collection instrument was critiqued and rated by a delphi group for the purposes of establishing validity and reliability. The instrument was mailed to the population with a letter of transmittal identifying the purpose of the study and directions on completing the survey. Statistical analyses were performed on the data to provide information relative to the research problem and questions of this study.

Conclusions

The results of this study demonstrate that C.R.N.A. program directors perceive discrepancies between the extent the 41 educational goals are met by the minimum academic requirements of the Council on Accreditation and the extent they should be met in the future when students enter all

nurse anesthesia programs with a baccalaureate degree. A comparison of the rank order of goals by their mean rating of future importance, with their rank order by mean size of discrepancy, provides a mechanism to prioritize areas needing change within the academic curriculum of nurse anesthesia educational programs. Although the goals are ranked by future importance ratings, 38 of the 41 goals had mean ratings on this scale above 5.0, indicating they were all perceived as highly important for the future.

On several goals there were significant differences between ratings by certificate, baccalaureate, and masters program directors on; present goal obtainability, the future importance of the goal, or the discrepancy. The differences in ratings of present goal obtainability on goals which addressed statistics, analysis of research articles, development of a research proposal, and implementation of a research proposal, demonstrated that certificate program directors believed these goals were met to a lesser extent than masters program directors perceived them as being met by the current minimum academic requirements. In addition, on the goals addressing development of a research proposal and statistics, certificate program directors also perceived these goals as being met to a lesser extent than baccalaureate program directors. These results imply that C.R.N.A. program directors may have been influenced by their own programs' curriculum when they rated these goals on present goal obtainability. Many of the masters programs

include statistics and research within their academic curriculum, however, these curriculum content areas are not currently included in the minimum academic requirements of the Council on Accreditation.

On goals pertaining to anatomy, physiology, and pathophysiology; and general, organic, and inorganic chemistry, masters program directors rated present goal obtainability significantly lower than both certificate and baccalaureate program directors. Biochemistry was also rated significantly lower on present goal obtainability by masters program directors than by baccalaureate program directors. The academic requirements of the Council on Accreditation include curriculum content areas pertaining to anatomy, physiology, pathophysiology, and chemistry. Therefore, these results demonstrate that masters program directors view the depth and breath of these minimal requirements from a different perspective than do certificate and baccalaureate program directors. This may be due to the fact that many masters level nurse anesthesia programs utilize courses within graduate schools to fulfill their curriculum requirements in these areas. They may perceive these courses as being beyond the minimum requirements, and therefore, believe the minimum requirements are extremely low in this content area.

Significant differences between C.R.N.A. program directors' ratings on the future importance of goals primarily involved those goals pertaining to research, i.e. statistics research methodology, analyzing research articles, writing

a clinical or research paper, developing a research proposal, and implementing a research proposal. Consistently, certificate program directors rated these goals lower on future importance than masters program directors. On the goal pertaining to implementing a research proposal, ratings by certificate program directors on future importance were also significantly lower than ratings by baccalaureate program directors. Again, these are curriculum areas that would be included in a masters level nurse anesthesia program, but most likely not included in a certificate program's curriculum. Many factors may influence the differences between certificate and masters program directors regarding the future importance of these goals. Masters programs are conducted by, or affiliated with graduate schools and thus are exposed to an academic environment where research plays a major role. Certificate programs, however, are primarily conducted and operated by hospitals, where the demand for involvement in research does not play as key a role as in an academic milieu. Also, masters program directors may view their mission in the education of nurse anesthetists differently than certificate program directors. While certificate program directors may believe their mission is to develop individuals who will be competent practitioners, masters program directors may, in addition, recognize a need for nurse anesthetists to expand their role beyond the activities involved with administering anesthesia.

Certificate program directors also rated the goal

pertaining to participation in supervised practice teaching significantly lower than baccalaureate or masters program directors. This may also imply a difference in the mission perceived, and that academic level program directors view their graduates as those individuals who will be faculty in the future, and thus, believe there is a need to assist them in developing teaching skills.

On the goals where discrepancies were perceived significantly different, it is essential to also evaluate the ratings of present obtainability and future importance. Those goals with significantly different discrepancies which pertained to ethics, the history of the Councils, physics, pharmacology, principles of general anesthesia, and electrocardiogram interpretation, demonstrated no significant difference between program levels on ratings of present goal obtainability or on future importance of the goal. The other three goals that had significantly different discrepancies were also significantly different on present goal obtainability ratings, but not on future importance of the goal ratings. These goals addressed anatomy, physiology, and pathophysiology; general, organic, and inorganic chemistry, and biochemistry.

On all of the goals where significant differences in the discrepancies were perceived, the masters program directors consistently perceived larger discrepancies than the directors of other level programs. Ratings on the future importance of these goals, however, were not significantly

different. Therefore, although masters program directors perceived these goals obtainable to a lesser extent than program directors of other level programs, directors of all level programs have similar views regarding their future importance.

Finally, it is important to note that on the goals that addressed the curriculum area of research, although they may have been rated significantly different on present goal obtainability and/or on future importance of the goal, none of them had significantly different discrepancies. Therefore, although masters program directors may believe these goals are more important in the future than certificate program directors, directors of all levels of programs have identified a need to include these goals to some extent within the curriculum of nurse anesthesia programs.

Recommendations

The results of this study demonstrate that C.R.N.A. program directors perceive a need for change in the extent educational goals can be met by the minimum academic requirements of the Council on Accreditation. Therefore, the results of this study should be used to initiate the process of making revisions in the academic requirements. The curriculum goals of these requirements should reflect the educational goals that C.R.N.A. program directors have identified as needing change, and as important goals for the future, when students enter all nurse anesthesia programs with a baccalaureate degree (1987).

It is recommended that this type of evaluation research be conducted periodically in nurse anesthesia education, as well as other disciplines, to assess the need for change perceived by program directors. This would reflect accountability by the decision makers who develop the standards, and facilitate input by program directors before changes are made rather than responding to changes after they have been drafted.

Further evaluation research is also recommended within individual nurse anesthesia programs to conduct a discrepancy analysis of their own curriculum goals. This procedure, if implemented on an on-going basis, will identify areas needing change within individual programs.

Appendix A

COUNCIL ON ACCREDITATION OF NURSE ANESTHESIA

EDUCATIONAL PROGRAMS/SCHOOLS

LIST OF RECOGNIZED EDUCATIONAL PROGRAMS

DECEMBER 1983

NUMBER	CERTIFICATE PROGRAMS	STATE
1	Manley L. Cummins School of Anesthesia for Nurses	Alabama
2	School of Anesthesia for Nurses-University of South Alabama Medical Center	Alabama
3	Los Angeles County, Martin Luther King, Jr./Drew Medical Center	California
4	Bridgeport Hospital School of Nurse Anesthesia	Connecticut
5	Hospital of St. Rapheal, School of Nurse Anesthesia	Connecticut
6	Wilmington Medical Center School of Anesthesia	Delaware
7	Nurse Anesthesia Training Program, University of Florida/College of Medicine	Florida
8	Bay City Memorial Medical Center, School of Nurse Anesthesia	Florida
9	Georgia Baptist Hospital School of Anesthesia for Nurses	Georgia
10	Ravenswood Hospital Medical Center School of Nurse Anesthesia	Illinois
11	Decatur Memorial Hospital Nurse Anesthesia Program	Illinois
12	Charity Hospital School for Nurse Anesthesia	Louisiana
13	Eastern Maine Medical Center School of Nurse Anesthesia	Maine
14	St. Mary's General Hospital School of Anesthesia for Nurses	Maine
15	Mercy Hospital School of Anesthesiology	Maine
16	The Johns Hopkins Hospital School of Anesthesia for Nurses	Maryland
17	Carney Hospital School of Anesthesia	Massachusetts
18	Tuft's-New England Medical Center Hospital School of Nurse Anesthesia	Massachusetts
19	Berkshire Medical Center School of Nurse Anesthesia	Massachusetts
20	St. Vicent Hospital School of Nurse Anesthesia	Massachusetts
21	Central Mesabi Medical Center School of Anesthesia	Minnesota
22	Minneapolis Veterans Administration Medical Center School of Anesthesia	Minnesota
23	St. Mary's Hospital School of Anesthesia	Minnesota
24	Mayo School of Health-Related Sciences Nurse Anesthesia Program	Minnesota
25	St. Paul-Ramsey Medical Center School of Nurse Anesthesia	Minnesota
26	Barnes Hospital School of Nurse Anesthesia	Missouri
27	Mary Hitchcock Memorial Hospital, School of Nurse Anesthesia	New Hampshire

NUMBER	CERTIFICATE PROGRAMS	STATE
28	Our Lady of Lourdes Hospital School of Anesthesia for Nurses	New Jersey
29	Jersey Shore Medical Center, School of Anesthesia	New Jersey
30	Albany Medical Center Hospital, School for Nurse Anesthetists	New York
31	Albany Veterans Administration Medical Center School of Anesthesia for Nurses	New York
32	Roswell Park Memorial Institute, School of Anesthesia for Nurses	New York
33	Harlem School Center/School of Anesthesia for Nurses	New York
34	Charlotte Memorial Hospital & Medical Center, School of Nurse Anesthesia	North Carolina
35	Durham County General Hosptial School of Anesthesia for Nurses	North Carolina
36	Central North Dakota School of Anesthesia	North Dakota
37	St. Luke's Hospital School of Anesthesia	North Dakota
38	The Grand Forks School of Anesthesia	North Dakota
39	Aultman Hospital School of Nurse Anesthesia	Ohio
40	University Hospital School of Nurse Anesthesia	Ohio
41	Cleveland Clinic School of Nurse Anesthesia	Ohio
42	Ohio Valley Hospital School of Anesthesia	Ohio
43	St. Vincent Hospital and Medical Center, School of Anesthesia for Nurses	Ohio
44	St. Elizabeth Hospital Medical Center School for Nurse Anesthetists	Ohio
45	Mercy Hospital, School of Anesthesia	Pennsylvania
46	Westmoreland-Latrobe School of Anesthesia	Pennsylvania
47	Harrisburg Area School of Anesthesia	Pennsylvania
48	St. Joseph Hospital & Health Care Center, School of Anesthesia	Pennsylvania
49	Montgomery Hospital School of Anesthesia	Pennsylvania
50	Lankenau Hospital School of Anesthesia for Nurses	Pennsylvania
51	The Nazareth Hospital School of Anesthesia for Nurses	Pennsylvania
52	Mercy Hospital School of Anesthesia for Nurses	Pennsylvania
53	Western Pennsylvania Hospital School of Anesthesia	Pennsylvania
54	University Health Center of Pittsburgh, School of Anesthesia for Nurses	Pennsylvania
55	Mercy Hospital School for Nurse Anesthetists	Pennsylvania
56	The Reading Hospital and Medical Center School of Nurse Anesthesia	Pennsylvania
57	Wilkes-Barre General Hospital School of Anesthesia	Pennsylvania
58	St. Joseph Hospital School of Anesthesia for Nurses	Rhode Island
59	The Memorial Hospital School of Nurse Anesthesia	Rhode Island
60	Richland Memorial Hospital School of Anesthesia	South Carolina
61	Erlanger Medical Center, School of Nurse Anesthesia	Tennessee

NUMBER	CERTIFICATE PROGRAMS	STATE
62	University of Tennessee Memorial Hospital, School of Nurse Anesthesia	Tennessee
63	Middle Tennessee School of Anesthesia	Tennessee
64	Nurse Anesthetist Course, Wilford Hall USAF Medical Center	Texas
65	Charleston Area Medical Center School of Nurse Anesthesia	West Virginia
66	St. Joseph's Hospital School of Anesthesia for Nurses	West Virginia
67	St. Francis School of Anesthesia	Wisconsin
68	Milwaukee County Medical Comples-School of Nurse Anesthesia	Wisconsin
69	Mercy Medical Center School of Anesthesia for Graduate Nurses	Wisconsin
70	Wausau Hospital Center, School of Anesthesia	
	BACCALAUREATE PROGRAMS	
71	Baptist Medical Centers-Samford University School of Anesthesia	Alabama
72	University of Alabama in Birmingham, School of Community and Allied Health Anesthesia for Nurses Program	Alabama
73	Loma Linda University-School of Allied Health Profession, Dept. of Anesthesia	California
74	U.S. Navy School of Nurse Anesthesia	California
75	Wesley College-Kent General Hospital School of Anesthesia	Delaware
76	Greater Southeast Community Hospital/George Washington University, School of Nurse Anesthesia	District of Columbia
77	University of Kansas, Nurse Anesthesia Education	Kansas
78	St. Francis Regional Medical Center School of Anesthesia for Nurses/Kansas Newman College	Kansas
79	The Wichita Clinical School of Anesthesia	Kansas
80	U.S. Navy Nurse Corps Anesthesia Program	Maryland
81	Prince George's General Hospital School of Anesthesia (George Washington University)	Maryland
82	Mt. Carmel Mercy Hospital/Mercy College	Michigan
83	Wayne State University College of Pharmacy & Allied Health Professions Nurse Anesthesia Educational Program	Michigan
84	Hurley Medical Center School of Anesthesia	Michigan
85	School of Health Related Professions, Department of Nurse Anesthesiology	Mississippi
86	Southwest Missouri School of Anesthesia (Southwest Missouri State University)	Missouri
87	Bryan Memorial Hospital/Nebraska Wesleyan University, School of Nurse Anesthesia	Nebraska
88	Creighton University Nurse Anesthesia Program	Nebraska

NUMBER	BACCALAUREATE PROGRAMS	STATE
89	Warren Wilson College/Asheville Anesthesia Associates, School of Anesthesia	North Carolina
90	North Carolina Baptist Hospital & Bowman Gray School of Medicine, Nurse Anesthesia Program	North Carolina
91	Mt. Sinai Medical Center School of Nurse Anesthesia	Ohio
92	The Ohio State University Nurse Anesthesia Division	Ohio
93	Geisinger Medical Center/Susquehanna University	Pennsylvania
94	Hamot Medical Center School of Anesthesia (Edinboro State College)	Pennsylvania
95	Lee Hospital/University of Pittsburgh at Johnstown, School of Anesthesia for Nurses	Pennsylvania
96	McKeesport Hospital School of Nurse Anesthesia/California State College	Pennsylvania
97	Allegheny Valley Hospital School of Anesthesia (LaRoche College)	Pennsylvania
98	LaRoche College Nurse Anesthesia Program	Pennsylvania
99	St. Francis General Hospital, LaRoche College	Pennsylvania
100	Shadyside Hospital School of Nurse Anesthesia/California State College	Pennsylvania
101	The Washington Hospital School of Anesthesia for Nurses (California State College)	Pennsylvania
102	McKennan Hospital School of Anesthesiology for Registered Nurses (University of South Dakota)	South Dakota
103	The Fairfax Hospital School of Anesthesia for Nurses (Affiliated with the George Washington University)	Virginia
104	DePaul Hospital School of Anesthesia	Virginia
105	Medical Center Hospital-Norfolk General Division	Virginia
106	U.S. Navy Nurse Corps Anesthesia School	Virginia
107	Potomac Hospital, School of Nurse Anesthesia	Virginia
	MASTERS PROGRAMS	
108	Kaiser-Permanente School of Anesthesia for Nurses/CSULB	California
109	UCLA Program of Nurse Anesthesia	California
110	U.S. Army Academy of Health Sciences/State University of New York at Buffalo Anesthesiology for Army Nurse Corps Officers	Colorado
111	New Britain School of Nurse Anesthesia	Connecticut
112	U.S. Army Academy of Health Sciences/State University of New York at Buffalo Anesthesiology for Army Nurse Corps Officers	District of Columbia
113	U.S. Army Academy of Health Sciences/State University of New York at Buffalo Anesthesiology for Army Nurse Corps Officers	Georgia

NUMBER	MASTERS PROGRAMS	STATE
114	U.S. Army Academy of Health Sciences/State University of New York at Buffalo Anesthesiology for Army Nurse Corps Officers	Hawaii
115	Rush University Anesthesia Nurse Practitioner Program	Illinois
116	The University of Michigan Hospitals Program of Nurse Anesthesia	Michigan
117	Henry Ford Hospital/University of Detroit Program of Nurse Anesthesia	Michigan
118	Abbott-Northwestern Hospital (St. Mary's College)	Minnesota
119	Minneapolis School of Anesthesia (St. Mary's College)	Minnesota
120	Truman Medical Center School of Nurse Anesthetists	Missouri
121	Kings County School of Anesthesia (Brooklyn College/SUNY)	New York
122	Nurse Anesthesia Program, Dept. of Graduate Education, School of Nursing State University of New York at Buffalo	New York
123	Columbia University/Roosevelt Hospital School of Anesthesia	New York
124	New York Medical College-Metropolitan Hospital Center School of Anesthesia for Nurses	New York
125	Medical College of Pennsylvania and Hospital Program of Nurse Anesthesia	Pennsylvania
126	Anesthesia for Nurses Program, College of Allied Health Sciences, Medical University of South Carolina	South Carolina
127	Mount Marty School of Anesthesia	South Dakota
128	Nurse Anesthesia Program, Holston Valley Hospital & Medical Center	Tennessee
129	U.S. Army Academy of Health Sciences/State University of New York at Buffalo Anesthesiology for Army Corps Officers	Texas
130	U.S. Army Academy of Health Sciences/State University of New York at Buffalo Anesthesiology for Army Corps Officers	Texas
131	Harris Hospital-Methodist School of Nurse Anesthesia in Association with Texas Wesleyan College	Texas
132	Baylor College of Medicine Nurse Anesthesia Program	Texas
133	University of Texas Health Science Center, School of Allied Health Sciences Program in Nurse Anesthesia Education	Texas
134	U.S. Academy of Health Sciences/State University of New York at Buffalo Anesthesiology for Army Nurse Corps Officers	Texas
135	Medical College of Virginia	Virginia
136	Sacred Heart Medical/Gonzaga University, Master of Anesthesiology Education	Washington
137	U.S. Army Academy of Health Sciences/State University of New York at Buffalo Anesthesiology for Army Crops Officers	Washington

Appendix B

Nurse Anesthesia Education Curriculum Content Survey

Introduction

The purpose of this questionnaire is to obtain information from CRNA program directors regarding your perception of educational goals that are met utilizing the Council on Accreditation's current minimum academic requirements, and the importance of these goals being met in the future, when a baccalaureate degree is required as an entry requirement for all nurse anesthesia programs.

Your response is important for providing a data base to assist in curriculum development. All data will be treated in an anonymous manner.

Please Note: For the purpose of this study a CRNA director is defined as a certified registered nurse anesthetist designated by title as program director or co-director; and/or the certified registered nurse anesthetist who by position and responsibility is actively involved in the organization and administration of the total program.

Var. 1 Study Number |____|____|____|____| Col. 1-4

Demographic Information

Please check only one box to complete each of the following statements.

Var. 2 I am "CRNA" Director of the following type of program:

Certificate	1 ☐	Col. 5
Baccalaureate (optional)	2 ☐	
Baccalaureate (mandatory)	3 ☐	
Masters (optional)	4 ☐	
Masters (mandatory)	5 ☐	

Var. 3 My sex is:

Male	1 ☐	Col. 6
Female	2 ☐	

Var. 4 My age is:

25-30	1 ☐	Col. 7
31-40	2 ☐	
41-50	3 ☐	
Over 50	4 ☐	

Var. 5 My highest academic degree is:

Baccalaureate in Anesthesia	1 ☐	Col. 8
Baccalaureate in Other Area	2 ☐	
Masters in Anesthesia	3 ☐	
Masters in Other Area	4 ☐	
Doctorate	5 ☐	

DIRECTIONS

Please complete the data collection portion of this instrument by performing the following steps:

1. Rate the goal statement in the *Goal Obtainability* column regarding the extent to which the goal is currently met if programs ONLY utilize the following minimum academic requirements of the Council on Accreditation:
   - A. Professional Aspects of Nurse Anesthesia (45 hours)
     1. Department Management & Organization
     2. Ethics
     3. History of Anesthesia
     4. Legal Aspects of Anesthesia (6 hours)
     5. Professional Adjustments (to include: local, state, national organizational structure and current issues)
     6. Psychology
   - B. Anatomy, Physiology & Pathophysiology in Relation to Anesthesia (135 hours)
     1. Cell Physiology
     2. Nervous System
     3. Respiratory System
     4. Circulatory System
     5. Endocrine System
     6. Excretory System
   - C. Chemistry & Physics in Relation to Anesthesia (60 hours)
   - D. Pharmacology in Relation to Anesthesia (75 hours)
   - E. Principles of Anesthesia Practice: Basic and Advanced (75 hours)
   - F. Journal Club, Seminars, Morbidity & Mortality Conferences and/or Other Clinical Correlative Conferences (35 hours)
   - G. Basic Cardiac Life Support (B.C.L.S.) or its equivalent

2. Rate the goal statement in the *Importance of Goal* column regarding the extent you feel goals should be met in the future, when students enter all nurse anesthesia programs with a baccalaureate degree.

Rating Scale

This scale measures the extent to which goals are met. It represents intermediate levels between (1) low and (7) high.

Directions

Please complete the data collection portion of this instrument by performing the following steps:

1. In the *"Present Goal Obtainability"* column on the left, rate the extent you believe each goal is met by the minimum academic requirements of the Council on Accreditation. (To assist you in performing this rating the Council on Accreditation's academic requirements are listed on the enclosed blue sheet.)

2. In the *"Future Importance of Goal"* column on the right, rate the extent you believe the goal should be met when students enter all nurse anesthesia programs with a baccalaureate degree (1987).

* * * * * * * * * * *

EXAMPLES

Present Goal Obtainability (low 1 2 3 4 5 6 7 high)	Goal	Future Importance of Goal (low 1 2 3 4 5 6 7 high)
(1)	Students acquire knowledge of principles and techniques of administering epidural anesthesia.	(7)
(7)	Students acquire a basic broad fields orientation to anesthesia practice.	(7)

(Note: All program directors should rate "Present Goal Obtainability" according to the Council's minimum academic requirements and NOT by "enrichment" beyond the minimum requirements they may include within their own program.)

* * * * * * * * * * *

DATA COLLECTION

Present Goal Obtainability (low 1 2 3 4 5 6 7 high)		Goal	Future Importance of Goal (low 1 2 3 4 5 6 7 high)
1 2 3 4 5 6 7	1.	Students acquire knowledge of departmental management and organization of an anesthesia department.	1 2 3 4 5 6 7
1 2 3 4 5 6 7	2.	Students acquire knowledge of ethical considerations for the profession of nurse anesthesia.	1 2 3 4 5 6 7
1 2 3 4 5 6 7	3.	Students acquire knowledge of the history of nurse anesthesia practice.	1 2 3 4 5 6 7
1 2 3 4 5 6 7	4.	Students acquire knowledge of the history of the American Association of Nurse Anesthetists (A.A.N.A.).	1 2 3 4 5 6 7
1 2 3 4 5 6 7	5.	Students acquire knowledge of the purposes and functions of the A.A.N.A.	1 2 3 4 5 6 7
1 2 3 4 5 6 7	6.	Students acquire knowledge of the purposes and functions of the state associations of nurse anesthetists.	1 2 3 4 5 6 7
1 2 3 4 5 6 7	7.	Students acquire knowledge of the history of the Councils; their structure, purposes and functions.	1 2 3 4 5 6 7
1 2 3 4 5 6 7	8.	Students acquire knowledge of legal aspects pertinent to the practice of nurse anesthesia.	1 2 3 4 5 6 7
1 2 3 4 5 6 7	9.	Students acquire knowledge of positive public relation techniques they can utilize as practitioners.	1 2 3 4 5 6 7
1 2 3 4 5 6 7	10.	Students acquire knowledge of important legislative issues affecting nurse anesthesia practice.	1 2 3 4 5 6 7

Present Goal Obtainability (low 1 2 3 4 5 6 7 high)		Future Importance of Goal (low 1 2 3 4 5 6 7 high)
1 2 3 4 5 6 7	11. Students acquire knowledge of mechanisms to actively participate in legislative issues affecting the profession of nurse anesthesia.	1 2 3 4 5 6 7
1 2 3 4 5 6 7	12. Students acquire knowledge of issues affecting the nursing profession in general, (e.g. nurse practice acts, educational trends, and licensure issues).	1 2 3 4 5 6 7
1 2 3 4 5 6 7	13. Students acquire knowledge of various employment opportunities for nurse anesthetists.	1 2 3 4 5 6 7
1 2 3 4 5 6 7	14. Students learn the important concepts of successful implementation of the anesthesia care team.	1 2 3 4 5 6 7
1 2 3 4 5 6 7	15. Students learn the responsibilities associated with independent practice in rural communities.	1 2 3 4 5 6 7
1 2 3 4 5 6 7	16. Students acquire knowledge of basic psychology.	1 2 3 4 5 6 7
1 2 3 4 5 6 7	17. Students acquire knowledge of anatomy, physiology and pathophysiology.	1 2 3 4 5 6 7
1 2 3 4 5 6 7	18. Students acquire knowledge of general, organic and inorganic chemistry applicable to anesthesia.	1 2 3 4 5 6 7
1 2 3 4 5 6 7	19. Students acquire knowledge of biochemistry applicable to anesthesia.	1 2 3 4 5 6 7
1 2 3 4 5 6 7	20. Students acquire knowledge of the principles of physics applicable to anesthesia.	1 2 3 4 5 6 7

Present Goal Obtainability (low 1 2 3 4 5 6 7 high)		Goal	Future Importance of Goal (low 1 2 3 4 5 6 7 high)
1 2 3 4 5 6 7	21.	Students acquire knowledge of pharmacology in relation to anesthesia.	1 2 3 4 5 6 7
1 2 3 4 5 6 7	22.	Students acquire knowledge of advanced physical assessment principles and techniques.	1 2 3 4 5 6 7
1 2 3 4 5 6 7	23.	Students actively participate in presenting case discussions and journal articles to peer group and the entire anesthesia department.	1 2 3 4 5 6 7
1 2 3 4 5 6 7	24.	Students complete both theory and practice of Basic Cardiac Life Support (B.C.L.S.).	1 2 3 4 5 6 7
1 2 3 4 5 6 7	25.	Students are prepared to participate in B.C.L.S. instruction within the hospital or in the community, (i.e. students receive certification as B.C.L.S. instructors).	1 2 3 4 5 6 7
1 2 3 4 5 6 7	26.	Students complete theory and practice of Advanced Cardiac Life Support (A.C.L.S.).	1 2 3 4 5 6 7
1 2 3 4 5 6 7	27.	Students acquire knowledge of principles of practice of general anesthesia.	1 2 3 4 5 6 7
1 2 3 4 5 6 7	28.	Students acquire knowledge of the anesthetic management of patients under regional anesthesia.	1 2 3 4 5 6 7
1 2 3 4 5 6 7	29.	Students acquire knowledge of principles and techniques of administering regional anesthesia.	1 2 3 4 5 6 7

Present Goal Obtainability								Goal	Future Importance of Goal						
low						high			low						high
1	2	3	4	5	6	7	30.	Students acquire knowledge of the principles and techniques of respiratory care.	1	2	3	4	5	6	7
1	2	3	4	5	6	7	31.	Students acquire knowledge of fundamentals of statistics.	1	2	3	4	5	6	7
1	2	3	4	5	6	7	32.	Students acquire knowledge of research methodologies.	1	2	3	4	5	6	7
1	2	3	4	5	6	7	33.	Students analyze research articles in anesthesia journals in regards to statistical analysis and methodologies used.	1	2	3	4	5	6	7
1	2	3	4	5	6	7	34.	Students write a clinical or research paper utilizing an acceptable format for publication.	1	2	3	4	5	6	7
1	2	3	4	5	6	7	35.	Students develop a proposal for a research project.	1	2	3	4	5	6	7
1	2	3	4	5	6	7	36.	Students implement a research proposal.	1	2	3	4	5	6	7
1	2	3	4	5	6	7	37.	Students acquire knowledge in staff relations, (i.e. between C.R.N.A.'s and other professional groups).	1	2	3	4	5	6	7
1	2	3	4	5	6	7	38.	Students acquire knowledge in curriculum, instruction and evaluation.	1	2	3	4	5	6	7
1	2	3	4	5	6	7	39.	Students participate in supervised practice teaching.	1	2	3	4	5	6	7
1	2	3	4	5	6	7	40.	Students acquire knowledge of E.C.G. interpretation.	1	2	3	4	5	6	7
1	2	3	4	5	6	7	41.	Students acquire knowledge of principles and techniques of advanced monitoring modalities.	1	2	3	4	5	6	7

If you wish to receive the results of this study, please complete the following information and mail this form with your survey.

Name: _____

Address: _____

_____

_____

_____

COUNCIL ON ACCREDITATION OF NURSE ANESTHESIA EDUCATIONAL PROGRAMS/SCHOOLS

ACADEMIC REQUIREMENTS

A. Professional Aspects of Nurse Anesthesia (45 hours)
   1. Department Management & Organization
   2. Ethics
   3. History of Anesthesia
   4. Legal Aspects of Anesthesia (6 hours)
   5. Professional Adjustments (to include: local, state, national organizational structure and current issues)
   6. Psychology

B. Anatomy, Physiology & Pathophysiology in Relation to Anesthesia (135 hours)
   1. Cell Physiology
   2. Nervous System
   3. Respiratory System
   4. Circulatory System
   5. Endocrine System
   6. Excretory System

C. Chemistry & Physics in Relation to Anesthesia (60 hours)

D. Pharmacology in Relation to Anesthesia (75 hours)

E. Principles of Anesthesia Practice: Basic and Advanced (75 hours)

F. Journal Club, Seminars, Morbidity & Mortality Conferences and/or Other Clinical Correlative Conferences (35 hours)

G. Basic Cardiac Life Support (B.C.L.S.) or its equivalent

Blue sheet

Appendix C

HENRY FORD HOSPITAL/UNIVERSITY OF DETROIT
PROGRAM OF NURSE ANESTHESIA
2799 West Grand Boulevard
Room 304, Clara Ford Pavilion
Detroit, Michigan 48202
(313) 876-2934

November 30, 1984

Thank you for your willingness to participate in the delphi group that will review and rate the measurement instrument to be used for my doctoral research study. This study has been designed to obtain information from CRNA program directors regarding their perceptions of goals that are currently met with the minimum academic requirements of the Council on Accreditation, and the importance of goals being met in the future when a baccalaureate degree is required as an entry requirement for all nurse anesthesia programs. It is hoped that analysis of this data will identify any need for change in the minimum academic requirements, as well as provide a data base to assist programs in curriculum development.

As a member of the delphi group, you will be sent a copy of the measurement instrument three times, for the purpose of establishing validity and reliability of the instrument. Instructions and a self-addressed, stamped envelope for the return of the questionnaire will be included.

Because of your knowledge and expertise in anesthesia education and the curriculum standards, your participation is extremely important to the value of this study. Other phases of this research cannot be carried out until the delphi group has completed their analysis of the questionnaire. Therefore, your prompt assistance will be appreciated. If you have any questions, please contace me at (313) 876-2934.

Sincerely,

Mary R. Vidaurri, CRNA, MS
Director

MRV/rtl

enc.

INSTRUCTIONS FOR REVIEW OF QUESTIONNAIRE I

A. Please review the goal statements in relation to: (1) the minimum academic standards, and (2) curriculum content that would currently be considered as "enrichment" in a nurse anesthesia educational program. Then, answer the following questions:

1. Is all academic curriculum content currently required in a nurse anesthesia program included within these goal statements?

___ yes ___ no (If no, please identify content that is not included under comments)

Comments:

2. Is curriculum content that would currently be considered "enrichment" included within these goal statements?

___ yes ___ no

Comments:

3. Is there any area of "enrichment" that is not included which you feel should be included in these goal statements?

___ no ___ yes (If yes, please identify content under comments)

Comments:

B. If you feel any of the goal statements need to be modified, reworded or deleted from this questionnaire, please write your recommended change directly under that goal statement on the questionnaire.

C. If you feel any goal statements need to be added to this questionnaire, please write them in on the last page of the questionnaire.

D. If you have any other comments or suggestions for the rest of the data gathering instrument, (i.e. introduction, demographic information or directions), please comment:

Appendix D

HENRY FORD HOSPITAL/UNIVERSITY OF DETROIT
PROGRAM OF NURSE ANESTHESIA
2799 West Grand Boulevard
Room 304, Clara Ford Pavilion
Detroit, Michigan 48202
(313) 876-2934

December 23, 1983

Thank you for reviewing the questionnaire and returning it to me in such a timely manner. Your comments and suggestions have been utilized to determine the content and language of the measurement instrument that will be used in this research study.

The second and third mailings of this instrument to the delphi group members are for the purposes of establishing reliability of the instrument. It is extremely important that you do not keep a copy of your ratings from the second mailing to influence your final ratings on this instrument.

Please complete the enclosed questionnaire and return it to me as soon as possible in the self-addressed, stamped envelope. Also, because it is essential that the directions are clear to the respondents, please comment if you have trouble understanding them, and if so, identify any changes you believe would improve their clarity.

Again, your prompt assistance is appreciated. If you have any questions please contact me at (313) 876-2934.

Sincerely,

Mary R. Vidaurri, CRNA, MS
Director

MRV/rtl

enc.

Appendix E

HENRY FORD HOSPITAL/UNIVERSITY OF DETROIT
PROGRAM OF NURSE ANESTHESIA
2799 West Grand Boulevard
Room 304, Clara Ford Pavilion
Detroit, Michigan 48202
(313) 876-2934

January 18, 1084

Dear CRNA Program Director,

The enclosed survey is concerned with educational goals for nurse anesthesia and has been designed as part of a nationwide study I am conducting to collect data for my doctoral dissertation.

As a CRNA who plays a key role in the educational process of future nurse anesthetists your input is extremely important to the value of this study. The information obtained will be used for statistical purposes and no individual CRNA director or program will be identified. It is hoped that analysis of this data will identify any need for change in the academic requirements of nurse anesthesia educational programs as well as provide a data base for curriculum planning and faculty development.

Please complete the survey prior to February 10, 1984 and return it in the enclosed self-addressed, stamped envelope. Any additional comments may be written on the last page of the survey.

I appreciate the valuable time you will be taking to complete this instrument and I thank you for your participation and cooperation. I will be pleased to send you a summary of the results if you desire.

Sincerely,

Mary R. Vidaurri, CRNA, MS
Director

MRV/rtl

enc.

Appendix F

HENRY FORD HOSPITAL/UNIVERSITY OF DETROIT
PROGRAM OF NURSE ANESTHESIA
2799 West Grand Boulevard
Room 304, Clara Ford Pavilion
Detroit, Michigan 48202
(313) 876-2934

February 10, 1984

Dear CRNA Program Director,

It is very important that your input be included in this study on educational goals for nurse anesthesia. In case you did not receive, or have misplaced the survey mailed to you in January, I have enclosed another copy.

Please complete the survey and return it in the enclosed self-addressed, stamped envelope by February 17, 1984. The information obtained will be used for statistical purposes and no individual CRNA director or program will be identified.

I appreciate the valuable time you will be taking to complete this instrument and I thank you for your participation and cooperation. I will be pleased to send you a summary of the results if you desire.

If you have already returned your survey, please disregard this reminder and do not return this second survey.

Sincerely,

Mary R. Vidaurri, CRNA, MS
Director

MRV/rtl

enc.

Appendix G

Table G-1

Analysis of Present Goal Obtainability of Goal 1 by Program Level

Source	df	SS	MS	F
Between groups	2	7.7857	3.8929	1.349
Within groups	113	326.0413	2.8853	
Total	115	333.8270		

Note. F not significant at $p < .05$.

Table G-2

Analysis of Future Importance of Goal 1 by Program Level

Source	df	SS	MS	F
Between groups	2	7.5445	3.7723	1.484
Within groups	112	284.6287	2.5413	
Total	114	292.1732		

Note. F not significant at $p < .05$.

Table G-3

Analysis of the Discrepancy of Goal 1 by Program Level

Source	df	SS	MS	F
Between groups	2	0.7104	0.3552	0.134
Within groups	112	297.2367	2.6539	
Total	114	297.9471		

Note. F not significant at $p < .05$.

Table G-4

Analysis of Present Goal Obtainability of Goal 2 by Program Level

Source	df	SS	MS	F
Between groups	2	4.0514	2.0257	0.829
Within groups	113	276.2500	2.4447	
Total	115	280.3014		

Note. F not significant at $p < .05$.

Table G-5

Analysis of Future Importance of Goal 2 by Program Level

Source	df	SS	MS	F
Between groups	2	4.1828	2.0914	1.720
Within groups	113	137.4287	1.2162	
Total	115	141.6115		

Note. F not significant at $p < .05$.

Table G-6

Analysis of the Discrepancy of Goal 2 by Program Level

Source	df	SS	MS	F
Between groups	2	13.9981	6.9991	3.784*
Within groups	113	209.0358	1.8499	
Total	115	223.0339		

*$p < .05$.

Table G-7

Analysis of Present Goal Obtainability of Goal 3 by Program Level

Source	df	SS	MS	F
Between groups	2	1.2057	0.6028	0.184
Within groups	113	369.5782	3.2706	
Total	115	370.7839		

Note. F not significant at $p < .05$.

Table G-8

Analysis of Future Importance of Goal 3 by Program Level

Source	df	SS	MS	F
Between groups	2	0.5022	0.2511	0.078
Within groups	113	364.0745	3.2219	
Total	115	364.5767		

Note. F not significant at $p < .05$.

Table G-9

Analysis of the Discrepancy of Goal 3 by Program Level

Source	df	SS	MS	F
Between groups	2	3.1040	1.5520	0.791
Within groups	113	221.6540	1.9615	
Total	115	224.7580		

Note. F not significant at $p < .05$.

Table G-10

Analysis of Present Goal Obtainability of Goal 4 by Program Level

Source	df	SS	MS	F
Between groups	2	4.5200	2.2600	0.673
Within groups	113	379.4363	3.3578	
Total	115	383.9563		

Note. F not significant at $p < .05$.

Table G-11

Analysis of Future Importance of Goal 4 by Program Level

Source	df	SS	MS	F
Between groups	2	0.0394	0.0197	0.007
Within groups	113	323.1664	2.8599	
Total	115	323.2058		

Note. F not significant at $p < .05$.

Table G-12

Analysis of the Discrepancy of Goal 4 by Program Level

Source	df	SS	MS	F
Between groups	2	5.0950	2.5475	0.981
Within groups	113	293.4819	2.5972	
Total	115	298.5769		

Note. F not significant at $p < .05$.

Table G-13

Analysis of Present Goal Obtainability of Goal 5 by Program Level

Source	df	SS	MS	F
Between groups	2	9.4628	4.7314	1.425
Within groups	113	375.2525	3.3208	
Total	115	384.7153		

Note. F not significant at $p < .05$.

Table G-14

Analysis of Future Importance of Goal 5 by Program Level

Source	df	SS	MS	F
Between groups	2	2.1602	1.0801	0.655
Within groups	113	186.3913	1.6495	
Total	115	188.5515		

Note. F not significant at $p < .05$.

Table G-15

Analysis of the Discrepancy of Goal 5 by Program Level

Source	df	SS	MS	F
Between groups	2	3.8319	1.9159	0.703
Within groups	113	308.1244	2.7268	
Total	115	311.9563		

Note. F not significant at $p < .05$.

Table G-16

Analysis of Present Goal Obtainability of Goal 6 by Program Level

Source	df	SS	MS	F
Between groups	2	20.7778	10.3889	3.038
Within groups	113	386.4281	3.4197	
Total	115	407.2059		

Note. F not significant at $p < .05$.

Table G-17

Analysis of Future Importance of Goal 6 by Program Level

Source	df	SS	MS	F
Between groups	2	0.6142	0.3071	0.170
Within groups	113	204.5922	1.8105	
Total	115	205.2064		

Note. F not significant at $p < .05$.

Table G-18

Analysis of the Discrepancy of Goal 6 by Program Level

Source	df	SS	MS	F
Between groups	2	18.5724	9.2862	2.996
Within groups	113	350.2546	3.0996	
Total	115	368.8270		

Note. F not significant at $p < .05$.

Table G-19

Analysis of Present Goal Obtainability of Goal 7 by Program Level

Source	df	SS	MS	F
Between groups	2	12.3190	6.1595	1.534
Within groups	112	449.6282	4.0145	
Total	114	461.9472		

Note. F not significant at $p < .05$.

Table G-20

Analysis of Future Importance of Goal 7 by Program Level

Source	df	SS	MS	F
Between groups	2	1.3867	0.6933	0.351
Within groups	112	221.5347	1.9780	
Total	114	222.9214		

Note. F not significant at $p < .05$.

Table G-21

Analysis of the Discrepancy of Goal 7 by Program Level

Source	df	SS	MS	F
Between groups	2	21.7311	10.8655	3.335*
Within groups	112	364.9116	3.2581	
Total	114	386.6427		

*$p < .05$

Table G - 22

Analysis of Present Goal Obtainability of Goal 8 by Program Level

Source	df	SS	MS	F
Between groups	2	7.8780	3.9390	1.595
Within groups	113	279.1210	2.4701	
Total	115	286.9990		

Note. F not significant at $p < .05$.

Table G-23

Analysis of Future Importance of Goal 8 by Program Level

Source	df	SS	MS	F
Between groups	2	.1435	0.0717	0.106
Within groups	113	76.6490	0.6783	
Total	115	76.7925		

Note. F not significant at $p < .05$.

Table G-24

Analysis of the Discrepancy of Goal 8 by Program Level

Source	df	SS	MS	F
Between groups	2	7.3171	3.6586	1.842
Within groups	113	224.4753	1.9865	
Total	115	231.7924		

Note. F not significant at $p < .05$.

Table G-25

Analysis of Present Goal Obtainability of Goal 9 by Program Level

Source	df	SS	MS	F
Between groups	2	23.7689	11.8845	3.059
Within groups	113	438.9457	3.8845	
Total	115	462.7146		

Note. F not significant at $p < .05$.

Table G-26

Analysis of Future Importance of Goal 9 by Program Level

Source	df	SS	MS	F
Between groups	2	2.1225	1.0613	0.690
Within groups	113	173.8424	1.5384	
Total	115	175.9649		

Note. F not significant at $p < .05$.

Table G-27

Analysis of the Discrepancy of Goal 9 by Program Level

Source	df	SS	MS	F
Between groups	2	11.6883	5.8441	1.536
Within groups	113	430.0608	3.8058	
Total	115	441.7491		

Note. F not significant at $p < .05$.

Table G-28

Analysis of Present Goal Obtainability of Goal 10 by Program Level

Source	df	SS	MS	F
Between groups	2	12.9882	6.4941	1.661
Within groups	113	441.7697	3.9095	
Total	115	454.7579		

Note. F not significant at $p < .05$.

Table G-29

Analysis of Future Importance of Goal 10 by Program Level

Source	df	SS	MS	F
Between groups	2	1.5509	0.7755	1.026
Within groups	113	85.4402	0.7561	
Total	115	86.9911		

Note. F not significant at $p < .05$.

Table G-30

Analysis of the Discrepancy of Goal 10 by Program Level

Source	df	SS	MS	F
Between groups	2	9.7892	4.8946	1.447
Within groups	113	382.1671	3.3820	
Total	115	391.9563		

Note. F not significant at $p < .05$.

Table G-31

Analysis of Present Goal Obtainability of Goal 11 by Program Level

Source	df	SS	MS	F
Between groups	2	20.9584	10.4792	2.911
Within groups	113	406.7907	3.5999	
Total	115	427.7491		

Note. F not significant at $p < .05$.

Table G-32

Analysis of Future Importance of Goal 11 by Program Level

Source	df	SS	MS	F
Between groups	2	2.0537	1.0269	0.768
Within groups	113	151.1523	1.3376	
Total	115	153.2060		

Note. F not significant at $p < .05$.

Table G-33

Analysis of the Discrepancy of Goal 11 by Program Level

Source	df	SS	MS	F
Between groups	2	11.6830	5.8415	1.812
Within groups	113	364.2731	3.2237	
Total	115	375.9561		

Note. F not sifnigicant at $p < .05$.

Table G-34

Analysis of Present Goal Obtainability of Goal 12 by Program Level

Source	df	SS	MS	F
Between groups	2	15.5561	7.7780	1.850
Within groups	113	473.3657	4.1891	
Total	115	488.9218		

Note. F not significant at $p < .05$.

Table G-35

Analysis of Future Importance of Goal 12 by Program Level

Source	df	SS	MS	F
Between groups	2	1.8475	0.9238	0.487
Within groups	113	214.4539	1.8978	
Total	115	216.3014		

Note. F not significant at $p < .05$.

Table G-36

Analysis of the Discrepancy of Goal 12 by Program Level

Source	df	SS	MS	F
Between groups	2	7.0230	3.5115	0.952
Within groups	113	416.7349	3.6879	
Total	115	423.7579		

Note. F not significant at $p < .05$.

Table G-37

Analysis of Present Goal Obtainability of Goal 13 by Program Level

Source	df	SS	MS	F
Between groups	2	16.8935	8.4467	2.089
Within groups	113	456.8645		
Total	115	473.7580		

Note. F not significant at $p < .05$.

Table G-38

Analysis of Future Importance of Goal 13 by Program Level

Source	df	SS	MS	F
Between groups	2	5.9101	2.9550	2.036
Within groups	113	163.9774	1.4511	
Total	115	169.8875		

Note. F not significant at $p < .05$.

Table G-39

Analysis of the Discrepancy of Goal 13 by Program Level

Source	df	SS	MS	F
Between groups	2	6.2964	3.1482	1.356
Within groups	113	262.2806	2.3211	
Total	115	268.5770		

Note. F not significant at $p < .05$.

Table G-40

Analysis of Present Goal Obtainability of Goal 14 by Program Level

Source	df	SS	MS	F
Between groups	2	6.8402	3.4201	1.050
Within groups	111	361.4488	3.2563	
Total	113	368.2890		

Note. F not significant at $p < .05$.

Table G-41

Analysis of Future Importance of Goal 14 by Program Level

Source	df	SS	MS	F
Between groups	2	1.9476	0.9738	0.743
Within groups	112	146.7998	1.3107	
Total	114	148.7474		

Note. F not significant at $p < .05$.

Table G-42

Analysis of the Discrepancy of Goal 14 by Program Level

Source	df	SS	MS	F
Between groups	2	3.1685	1.5842	0.666
Within groups	111	263.9626	2.3780	
Total	113	267.1311		

Note. F not significant at $p < .05$.

Table G-43

Analysis of Present Goal Obtainability of Goal 15 by Program Level

Source	df	SS	MS	F
Between groups	2	4.8343	2.4171	0.612
Within groups	113	445.9497	3.9465	
Total	115	450.7840		

Note. F not significant at $p < .05$.

Table G-44

Analysis of Future Importance of Goal 15 by Program Level

Source	df	SS	MS	F
Between groups	2	4.2274	2.1147	1.365
Within groups	113	174.9792	1.5485	
Total	115	179.2066		

Note. F not significant at $p < .05$.

Table G-45

Analysis of the Discrepancy of Goal 15 by Program Level

Source	df	SS	MS	F
Between groups	2	1.0549	0.5275	0.192
Within groups	113	310.4875	2.7477	
Total	115	311.5422		

Note. F not significant at $p < .05$.

Table G-46

Analysis of Present Goal Obtainability of Goal 16 by Program Level

Source	df	SS	MS	F
Between groups	2	8.4249	4.2125	1.278
Within groups	112	369.1049	3.2956	
Total	114	377.5298		

Note. F not significant at $p < .05$.

Table G-47

Analysis of Future Importance of Goal 16 by Program Level

Source	df	SS	MS	F
Between groups	2	3.4211	1.7106	0.587
Within groups	111	323.7012	2.9162	
Total	113	327.1223		

Note. F not significant at $p < .05$.

Table G-48

Analysis of the Discrepancy of Goal 16 by Program Level

Source	df	SS	MS	F
Between groups	2	1.2803	0.6402	0.231
Within groups	111	307.7365	2.7724	
Total	113	309.0168		

Note. F not significant at $p < .05$.

Table G-49

Analysis of Present Goal Obtainability of Goal 17 by Program Level

Source	df	SS	MS	F
Between groups	2	9.4966	4.7483	3.754*
Within groups	112	141.6677	1.2649	
Total	114	151.1643		

*$p < .05$.

Table G-50

Analysis of Future Importance of Goal 17 by Program Level

Source	df	SS	MS	F
Between groups	2	0.3112	0.1556	0.298
Within groups	113	58.9299	0.5215	
Total	115	59.2411		

Note. F not significant at $p < .05$.

Table G-51

Analysis of the Discrepancy of Goal 17 by Program Level

Source	df	SS	MS	F
Between groups	2	14.3305	7.1653	4.850*
Within groups	112	165.4603	1.4773	
Total	114	179.7908		

* $p < .01$.

Table G-52

Analysis of Present Goal Obtainability of Goal 18 by Program Level

Source	df	SS	MS	F
Between groups	2	17.2689	8.6345	4.252*
Within groups	113	229.4463	2.0305	
Total	115	246.7152		

*p < .05.

Table G-53

Analysis of Future Importance of Goal 18 by Program Level

Source	df	SS	MS	F
Between groups	2	0.4246	0.2123	0.226
Within groups	113	106.2646	0.9404	
Total	115	106.6892		

Note. F not significant at p < .05.

Table G-54

Analysis of the Discrepancy of Goal 18 by Program Level

Source	df	SS	MS	F
Between groups	2	14.9736	7.4868	3.436*
Within groups	113	246.2241	2.1790	
Total	115	261.1977		

*p < .05.

Table G-55

Analysis of Present Goal Obtainability of Goal 19 by Program Level

Source	df	SS	MS	F
Between groups	2	15.4657	7.7328	3.142*
Within groups	113	278.0850	2.4609	
Total	115	293.5507		

*p < .05.

Table G-56

Analysis of Future Importance of Goal 19 by Program Level

Source	df	SS	MS	F
Between groups	2	0.4871	0.2435	0.343
Within groups	113	80.2971	0.7106	
Total	115	80.7842		

Note. F not significant at p < .05.

Table G-57

Analysis of the Discrepancy of Goal 19 by Program Level

Source	df	SS	MS	F
Between groups	2	15.2175	7.6087	3.555*
Within groups	113	241.8424	2.1402	
Total	115	257.0599		

*p < .05.

Table G-58

Analysis of Present Goal Obtainability of Goal 20 by Program Level.

Source	df	SS	MS	F
Between groups	2	16.3568	8.1784	3.049
Within groups	112	300.3906	2.6821	
Total	114	316.7474		

Note. F not significant at $p < .05$.

Table G-59

Analysis of Future Importance of Goal 20 by Program Level

Source	df	SS	MS	F
Between groups	2	0.0364	0.0182	0.019
Within groups	113	108.1703	0.9573	
Total	115	108.2067		

Note. F not significant at $p < .05$.

Table G-60

Analysis of the Discrepancy of Goal 20 by Program Level

Source	df	SS	MS	F
Between groups	2	16.1384	8.0692	3.629*
Within groups	112	249.0436	2.2236	
Total	114	265.1820		

*$p < .05$.

Table G-61

Analysis of Present Goal Obtainability of Goal 21 by Program Level

Source	df	SS	MS	F
Between groups	2	6.0711	3.0356	1.944
Within groups	113	176.4371	1.5614	
Total	115	182.5083		

Note. F not significant at $p < .05$.

Table G-62

Analysis of Future Importance of Goal 21 by Program Level

Source	df	SS	MS	F
Between groups	2	0.1565	0.0782	0.391
Within groups	113	22.6020	0.2000	
Total	115	22.7585		

Note. F not significant at $p < .05$.

Table G-63

Analysis of the Discrepancy of Goal 21 by Program Level

Source	df	SS	MS	F
Between groups	2	8.0850	4.0425	3.136*
Within groups	113	145.6645	1.2891	
Total	115	153.7495		

*$p < .05$.

Table G - 64

Analysis of Present Goal Obtainability of Goal 22 by Program Level

Source	df	SS	MS	F
Between groups	2	13.8281	6.9141	2.107
Within groups	112	367.5625	3.2818	
Total	114	381.3906		

Note. F not significant at $p < .05$.

Table G -65

Analysis of Future Importance of Goal 22 by Program Level

Source	df	SS	MS	F
Between groups	2	1.4117	0.7058	0.978
Within groups	113	81.5792	0.7219	
Total	115	82.9909		

Note. F not significant at $p < .05$.

Table G-66

Analysis of the Discrepancy of Goal 22 by Program Level

Source	df	SS	MS	F
Between groups	2	8.6777	4.3389	1.547
Within groups	112	314.0694	2.8042	
Total	114	322.7471		

Note. F not significant at $p < .05$.

Table G-67

Analysis of Present Goal Obtainability of Goal 23 by Program Level

Source	df	SS	MS	F
Between groups	2	5.1958	2.5979	0.807
Within groups	113	363.5622	3.2174	
Total	115	368.7580		

Note. F not significant at $p < .05$.

Table G-68

Analysis of Future Importance of Goal 23 by Program Level

Source	df	SS	MS	F
Between groups	2	2.1715	1.0858	1.150
Within groups	113	106.6552	0.9439	
Total	115	108.8267		

Note. F not significant at $p < .05$.

Table G-69

Analysis of the Discrepancy of Goal 23 by Program Level

Source	df	SS	MS	F
Between groups	2	5.7463	2.8731	1.085
Within groups	113	299.2876	2.6486	
Total	115	305.0339		

Note. F not significant at $p < .05$.

Table G-70

Analysis of Present Goal Obtainability of Goal 24 by Program Level

Source	df	SS	MS	F
Between groups	2	2.0606	1.0303	0.426
Within groups	113	272.9992	2.4159	
Total	115	275.0598		

Note. F not significant at $p < .05$.

Table G-71

Analysis of Future Importance of Goal 24 by Program Level

Source	df	SS	MS	F
Between groups	2	0.2171	0.1085	0.058
Within groups	113	212.8426	1.8836	
Total	115	213.0597		

Note. F not significant at $p < .05$.

Table G-72

Analysis of the Discrepancy of Goal 24 by Program Level

Source	df	SS	MS	F
Between groups	2	1.7788	0.8894	0.365
Within groups	113	275.4619	2.4377	
Total	115	277.2407		

Note. F not significant at $p < .05$.

Table G-73

Analysis of Present Goal Obtainability of Goal 25 by Program Level

Source	df	SS	MS	F
Between groups	2	1.3758	0.6879	0.153
Within groups	113	506.8306	4.4852	
Total	115	508.2064		

Note. F not significant at $p < .05$.

Table G-74

Analysis of Future Importance of Goal 25 by Program Level

Source	df	SS	MS	F
Between groups	2	5.1586	2.5793	0.755
Within groups	113	386.0392	3.4163	
Total	115	391.1978		

Note. F not significant at $p < .05$.

Table G-75

Analysis of the Discrepancy of Goal 25 by Program Level

Source	df	SS	MS	F
Between groups	2	10.5159	5.2580	1.087
Within groups	113	546.4057	4.8354	
Total	115	556.9216		

Note. F not significant at $p < .05$.

Table G-76

Analysis of Present Goal Obtainability of Goal 26 by Program Level

Source	df	SS	MS	F
Between groups	2	4.4831	2.2416	0.412
Within groups	113	614.2310	5.4357	
Total	115	618.7141		

Note. F not significant at $p < .05$.

Table G-77

Analysis of Future Importance of Goal 26 by Program Level

Source	df	SS	MS	F
Between groups	2	0.7554	0.3777	0.166
Within groups	113	256.6923	2.2716	
Total	115	257.4477		

Note. F not significant at $p < .05$.

Table G-78

Analysis of the Discrepancy of Goal 26 by Program Level

Source	df	SS	MS	F
Between groups	2	3.2739	1.6369	0.325
Within groups	113	569.1646	5.0369	
Total	115	572.4385		

Note. F not significant at $p < .05$.

Table G-79

Analysis of Present Goal Obtainability of Goal 27 by Program Level

Source	df	SS	MS	F
Between groups	2	7.6583	3.8292	2.987
Within groups	113	144.8497	1.2819	
Total	115	152.5080		

Note. F not significant at $p < .05$.

Table G-80

Analysis of Future Importance of Goal 27 by Program Level

Source	df	SS	MS	F
Between groups	2	0.1230	0.0615	0.498
Within groups	112	13.8247	0.1234	
Total	114	13.9477		

Note. F not significant at $p < .05$.

Table G-81

Analysis of the Discrepancy of Goal 27 by Program Level

Source	df	SS	MS	F
Between groups	2	10.0832	5.0416	4.649*
Within groups	112	120.2991	1.0741	
Total	114	130.3823		

*$p < .05$.

Table G-82

Analysis of Present Goal Obtainability of Goal 28 by Program Level

Source	df	SS	MS	F
Between groups	2	5.8146	2.9073	1.094
Within groups	113	300.2195	2.6568	
Total	115	206.0340		

Note. F not significant at $p < .05$.

Table G-83

Analysis of Future Importance of Goal 28 by Program Level

Source	df	SS	MS	F
Between groups	2	0.5160	0.2580	1.067
Within groups	113	27.3111	0.2417	
Total	115	27.8271		

Note. F not significant at $p < .05$.

Table G-84

Analysis of the Discrepancy of Goal 28 by Program Level

Source	df	SS	MS	F
Between groups	2	7.9772	3.9886	1.640
Within groups	113	274.7807	2.4317	
Total	115	282.7579		

Note. F not significant at $p < .05$.

Table G-85

Analysis of Present Goal Obtainability of Goal 29 by Program Level

Source	df	SS	MS	F
Between groups	2	0.9089	0.4544	0.092
Within groups	112	551.6631	4.9256	
Total	114	552.5720		

Note. F not significant at $p < .05$.

Table G-86

Analysis of Future Importance of Goal 29 by Program Level

Source	df	SS	MS	F
Between groups	2	1.2753	0.6377	0.914
Within groups	112	78.1158	0.6975	
Total	114	79.3911		

Note. F not significant at $p < .05$.

Table G-87

Analysis of the Discrepancy of Goal 29 by Program Level

Source	df	SS	MS	F
Between groups	2	1.3236	0.6618	0.137
Within groups	112	541.1624	4.8318	
Total	114	542.4858		

Note. F not significant at $p < .05$.

Table G-88

Analysis of Present Goal Obtainability of Goal 30 by Program Level

Source	df	SS	MS	F
Between groups	2	0.2903	0.1451	0.047
Within groups	113	347.4586	3.0749	
Total	115	347.7489		

Note. F not significant at $p < .05$.

Table G-89

Analysis of Future Importance of Goal 30 by Program Level

Source	df	SS	MS	F
Between groups	2	0.7393	0.3696	0.210
Within groups	112	197.2080	1.7608	
Total	114	197.9473		

Note. F not significant at $p < .05$.

Table G-90

Analysis of the Discrepancy of Goal 30 by Program Level

Source	df	SS	MS	F
Between groups	2	0.6849	0.3425	0.130
Within groups	112	295.8360	2.6414	
Total	114	296.5209		

Note. F not significant at $p < .05$.

Table G-91

Analysis of Present Goal Obtainability of Goal 31 by Program Level

Source	df	SS	MS	F
Between groups	2	27.7240	13.8620	4.794*
Within groups	112	323.8753	2.8917	
Total	114	351.5993		

*$p < .05$.

Table G-92

Analysis of Future Importance of Goal 31 by Program Level

Source	df	SS	MS	F
Between groups	2	32.5871	16.2935	6.931*
Within groups	112	263.2734	2.3507	
Total	114	295.8605		

*$p < .01$.

Table G-93

Analysis of the Discrepancy of Goal 31 by Program Level

Source	df	SS	MS	F
Between groups	2	1.6515	0.8257	0.251
Within groups	112	368.6087	3.2911	
Total	114	370.2602		

Note. F not significant at $p < .05$.

Table G-94

Analysis of Present Goal Obtainability of Goal 32 by Program Level

Source	df	SS	MS	F
Between groups	2	13.2114	6.6057	2.053
Within groups	111	357.2086	3.2181	
Total	113	370.4200		

Note. F not significant at $p < .05$.

Table G-95

Analysis of Future Importance of Goal 32 by Program Level

Source	df	SS	MS	F
Between groups	2	24.4116	12.2058	4.810*
Within groups	112	284.2314	2.5378	
Total	114	308.6430		

*$p < .01$.

Table G-96

Analysis of the Discrepancy of Goal 32 by Program Level

Source	df	SS	MS	F
Between groups	2	1.3546	0.6773	0.176
Within groups	111	427.2150	3.8488	
Total	113	428.5696		

Note. F not significant at $p < .05$.

Table G-97

Analysis of Present Goal Obtainability of Goal 33 by Program Level

Source	df	SS	MS	F
Between groups	2	27.5525	13.7763	4.345*
Within groups	112	355.1077	3.1706	
Total	114	382.6602		

*$p < .05$.

Table G-98

Analysis of Future Importance of Goal 33 by Program Level

Source	df	SS	MS	F
Between groups	2	27.8406	13.9203	5.228*
Within groups	113	300.8740	2.6626	
Total	115	328.7146		

*$p < .01$.

Table G-99

Analysis of the Discrepancy of Goal 33 by Program Level

Source	df	SS	MS	F
Between groups	2	1.1171	0.5586	0.144
Within groups	112	433.3691	3.8694	
Total	114	434.4862		

Note. F not significant at $p < .05$.

Table G-100

Analysis of Present Goal Obtainability of Goal 34 by Program Level

Source	df	SS	MS	F
Between groups	2	20.9061	10.4531	1.966
Within groups	113	600.8508	5.3173	
Total	115	621.7569		

Note. F not significant at $p < .05$.

Table G-101

Analysis of Future Importance of Goal 34 by Program Level

Source	df	SS	MS	F
Between groups	2	16.8738	8.4369	3.833*
Within groups	113	248.7372	2.2012	
Total	115	265.6110		

*$p < .05$.

Table G-102

Analysis of the Discrepancy of Goal 34 by Program Level

Source	df	SS	MS	F
Between groups	2	11.2583	5.6291	1.227
Within groups	113	518.2843	4.5866	
Total	115	529.5426		

Note. F not significant at $p < .05$.

Table G-103

Analysis of Present Goal Obtainability of Goal 35 by Program Level

Source	df	SS	MS	F
Between groups	2	33.1884	16.5942	3.652*
Within groups	112	508.9325	4.5440	
Total	114	542.1209		

*$p < .05$.

Table G-104

Analysis of Future Importance of Goal 35 by Program Level

Source	df	SS	MS	F
Between groups	2	36.6688	18.3344	5.944*
Within groups	112	345.4523	3.0844	
Total	114	382.1211		

*$p < .01$.

Table G-105

Analysis of the Discrepancy of Goal 35 by Program Level

Source	df	SS	MS	F
Between groups	2	6.3862	3.1931	0.742
Within groups	111	477.7975	4.3045	
Total	113	484.1837		

Note. F not significant at $p < .05$.

Table G-106

Analysis of Present Goal Obtainability of Goal 36 by Program Level

Source	df	SS	MS	F
Between groups	2	30.0503	15.0252	3.579*
Within groups	112	470.2097	4.1983	
Total	114	500.2600		

*$p < .05$.

Table G-107

Analysis of Future Importance of Goal 36 by Program Level

Source	df	SS	MS	F
Between groups	2	40.8226	20.7113	6.135*
Within groups	112	372.6202	3.3270	
Total	114	413.4428		

*$p < .01$.

Table G-108

Analysis of the Discrepancy of Goal 36 by Program Level

Source	df	SS	MS	F
Between groups	2	5.1786	2.5893	0.628
Within groups	111	457.3205	4.1200	
Total	113	462.4991		

Note. F not significant at $p < .05$.

Table G-109

Analysis of Present Goal Obtainability of Goal 37 by Program Level

Source	df	SS	MS	F
Between groups	2	1.9522	0.9761	0.231
Within groups	112	473.2123	4.2251	
Total	114	475.1645		

Note. F not significant at $p < .05$.

Table G-110

Analysis of Future Importance of Goal 37 by Program Level

Source	df	SS	MS	F
Between groups	2	6.7933	3.3966	2.141
Within groups	112	177.6931	1.5865	
Total	114	184.4864		

Note. F not significant at $p < .05$.

Table G-111

Analysis of the Discrepancy of Goal 37 by Program Level

Source	df	SS	MS	F
Between groups	2	8.2212	4.1106	1.442
Within groups	112	319.2215	2.8502	
Total	114	327.4427		

Note. F not significant at $p < .05$.

Table G-112

Analysis of Present Goal Obtainability of Goal 38 by Program Level

Source	df	SS	MS	F
Between groups	2	12.5997	6.2999	2.295
Within groups	112	307.4863	2.7454	
Total	114	320.0860		

Note. F not significant at $p < .05$.

Table G-113

Analysis of Future Importance of Goal 38 by Program Level

Source	df	SS	MS	F
Between groups	2	15.2261	7.6130	2.460
Within groups	112	346.6340	3.0949	
Total	114	361.8601		

Note. F not significant at $p < .05$.

Table G-114

Analysis of the Discrepancy of Goal 38 by Program Level

Source	df	SS	MS	F
Between groups	2	1.6652	0.8326	0.210
Within groups	112	443.0645	3.9559	
Total	114	444.7297		

Note. F not significant at $p < .05$.

Table G-115

Analysis of Present Goal Obtainability of Goal 39 by Program Level

Source	df	SS	MS	F
Between groups	2	11.7197	5.8599	1.719
Within groups	113	385.1417	3.4083	
Total	115	396.8614		

Note. F not significant at $p < .05$.

Table G-116

Analysis of Future Importance of Goal 39 by Program Level

Source	df	SS	MS	F
Between groups	2	20.1582	10.0791	3.354*
Within groups	111	333.5955	3.0054	
Total	113	353.7537		

*$p < .05$.

Table G-117

Analysis of the Discrepancy of Goal 39 by Program Level

Source	df	SS	MS	F
Between groups	2	2.2342	1.1171	0.345
Within groups	111	359.0984	3.2351	
Total	113	361.3326		

Note. F not significant at $p < .05$.

Table G-118

Analysis of Present Goal Obtainability of Goal 40 by Program Level

Source	df	SS	MS	F
Between groups	2	19.4265	9.7132	2.820
Within groups	111	382.3275	3.4444	
Total	113	401.7540		

Note. F not significant at $p < .05$.

Table G-119

Analysis of Future Importance of Goal 40 by Program Level

Source	df	SS	MS	F
Between groups	2	0.6679	0.3340	0.299
Within groups	113	126.1938	1.1168	
Total	115	126.8617		

Note. F not significant at $p < .05$.

Table G-120

Analysis of the Discrepancy of Goal 40 by Program Level

Source	df	SS	MS	F
Between groups	2	22.3561	11.1781	3.309*
Within groups	111	374.9766	3.3782	
Total	113	397.3327		

*$p < .05$.

Table G-121

Analysis of Present Goal Obtainability of Goal 41 by Program Level

Source	df	SS	MS	F
Between groups	2	11.9798	5.9899	1.640
Within groups	113	412.7779	3.6529	
Total	115	424.7577		

Note. F not significant at $p < .05$.

Table G-122

Analysis of Future Importance of Goal 41 by Program Level

Source	df	SS	MS	F
Between groups	2	0.3169	0.1585	0.216
Within groups	112	82.3437	0.7352	
Total	114	82.6606		

Note. F not significant at $p < .05$.

Table G-123

Analysis of the Discrepancy of Goal 41 by Program Level

Source	df	SS	MS	F
Between groups	2	10.9852	5.4926	1.432
Within groups	112	429.6574	3.8362	
Total	114	440.6426		

Note. F not significant at $p < .05$.

Appendix H

RANKING OF GOALS BY MEAN DISCREPANCIES

Rank	Goal content	M
1	Mechanisms to actively participate in legislative issues	2.875
2	Positive public relation techniques	2.768
3	Research methodologies	2.761
4	Advanced Cardiac Life Support	2.744
5	Principles and techniques of administering regional anesthesia	2.580
6	Legislative issues affecting nurse anesthesia	2.575
7	Fundamentals of statistics	2.570
8	Curriculum, instruction, evaluation	2.517
9	Implement a research proposal	2.508
10	Develop a proposal for a research project	2.443
11	Analyze anesthesia research articles in regards to statistics and research methodologies	2.436
12	Participate in supervised practice teaching	2.378
13	Issues affecting the nursing profession in general	2.343
14	Writing a clinical or research paper	2.135
15	Certification as Basic Cardiac Life Support instructor	2.014
16	Advanced physical assessment principles and techniques	1.985
17	Responsibilities of independent practice in rural communities	1.856
18	Staff relations with other professional groups	1.750

Rank	Goal Content	M
19	Purpose and functions of state associations	1.704
20	Principles and techniques of advanced monitoring modalities	1.630
21	History of Councils: their structure, purposes and functions	1.571
22	Electrocardiogram interpretation	1.481
23	Purposes and functions of the A.A.N.A.	1.403
24	Employment opportunities for nurse anesthetists	1.363
25	Present case discussions and journal articles to peers and department	1.273
26	Concepts to implement successful anesthesia care team	1.238
27	Biochemistry	1.199
28	Principles and techniques of respiratory care	1.198
29	Anesthetic management of patients under regional anesthesia	1.187
30	Legal aspects	1.154
31	Management and organization of an anesthesia department	1.070
32	Physics	0.924
33	Ethics	0.855
34	Pharmacology	0.823
35	General, organic, inorganic chemistry	0.776
36	Anatomy, physiology, pathophysiology	0.697
37	Principles of practice of general anesthesia	0.663
38	Basic psychology	0.619

Rank	Goal Content	M
39	History of A.A.N.A.	0.597
40	Basic Cardiac Life Support	0.255
41	History of nurse anesthesia practice	0.019

Appendix I

RANKING OF GOALS BY MEAN RATING
OF FUTURE IMPORTANCE

Rank	Goal content	M
1	Principles of practice of general anesthesia	6.910
2	Pharmacology	6.904
3	Anesthetic management of patients under regional anesthesia	6.830
4	Anatomy, physiology, pathophysiology	6.776
5	Principles and techniques of administering regional anesthesia	6.643
6	Principles and techniques of advanced monitoring modalities	6.627
7	Legal aspects	6.626
8	Electrocardiogram interpretation	6.555
9	Advanced physical assessment principles and techniques	6.499
10	Biochemistry	6.475
11	General, organic, inorganic chemistry	6.457
12	Legislative issues affecting nurse anesthesia	6.455
13	Basic Cardiac Life Support	6.357
14	Present case discussions and journal articles to peers and department	6.346
15	Physics	6.339
16	Ethics	6.268
17	Purposes and functions of A.A.N.A.	6.137
18	Mechanisms to actively participate in legislative issues	6.135

Rank	Goal content	M
19	Concepts to implement successful anesthesia care team	6.101
20	Positive public relations techniques	5.974
21	Advanced Cardiac Life Support	5.944
22	Staff relations with other professional groups	5.938
23	Issues affecting the nursing profession in general	5.935
24	Principles and techniques of respiratory care	5.929
25	Employment opportunities for nurse anesthetists	5.848
26	Writing a clinical or research paper	5.845
27	Responsibilities of independent practice in rural community	5.832
28	Purposes and functions of state associations	5.820
29	History of Councils; their structure, purposes and functions	5.643
30	Research methodologies	5.416
31	Develop a proposal for a research project	5.411
32	Analyze anesthesia research articles in regards to statistics and research methodologies	5.382
33	Certification as a Basic Cardiac Life Support instructor	5.330
34	Implement a research proposal	5.253
35	Management and organization of an anesthesia department	5.246
36	History of A.A.N.A.	5.150

Rank	Goal content	M
37	Fundamentals of statistics	5.138
38	Participate in supervised practice teaching	5.009
39	Curriculum, instruction, evaluation	4.952
40	Basic psychology	4.946
41	History of nurse anesthesia practice	4.549

References

American Association of Nurse Anesthetists. (1969). Notes on the history and organization of the American Association of Nurse Anesthetists. Chicago: Author.

American Association of Nurse Anesthetists. (1975). Editoral. Journal of the American Association of Nurse Anesthetists, 40(1), 4-6.

Anderson, S. B. & Ball, S. (1978) The profession and practice of program evaluation. San Francisco: Jossey-Bass.

Anderson, S., Ball, S. & Murphy, R. (1977). Enclyclopedia of educational evaluation. Discrepancy evaluation. San Francisco: Jossey-Bass.

Buttram, J. L. & Covert, R. W. (1977). The discrepancy evaluation model: A systematic approach for the evaluation of career planning and placement programs. (ERIC Document Reproduction Service No. ED 143 683)

Council on Accreditation of Nurse Anesthesia Educational Programs/Schools. (1980). Accreditation policies and procedures. Park Ridge, IL: Author.

Council on Accreditation of Nurse Anesthesia Educational Programs/Schools. (1983). Educational standards and guidelines. Park Ridge, IL: Author.

Council on Accreditation of Nurse Anesthesia Educational Programs/Schools. (1983). List of recognized educational programs. Park Ridge, IL: Author.

Davis, B. G. (1974). Design and implementation of a discrepancy analysis model for educational programs. (ERIC Document Reproduction Service No. ED 099 421)

Effarah, J. E. (1977). The impact of electronic data processing on business education in the secondary schools of Oregon (Doctoral dissertation, University of Oregon).

Gardner, P. L. (1975). Scales and statistics. Review of Educational Research, 45(1), 43-57.

Halliburton, S. A. (1980). Curriculum intent and the graduate's perception of professional needs: A critical analysis. Journal of the American Association of Nurse Anesthetists, 48(6), 529-534.

Jonassen, D. H. (1978). A discrepancy model for I.T.V. program evaluation: An instrument for teachers. (ERIC Document Reproduction Service No. ED 165 795)

Kerlinger, F. N. (1973). Foundations of behavioral research (2nd ed.). New York: Hott, Rinehart and Winston.

McIntyre, J. (1979). An administrator's guide to systematic curriculum. The Clearing House, 52, 207.

Medley, F. W., Jr. (1979). Identifying needs and setting goals. Building on experience-building on success. In ACTFL Foreign Language Educational Series (Vol. 10, pp. 41-65). Skokie, IL: National Textbook.

Morra, L. G. (1978). The discrepancy evaluation model: A strategy for improving a simulation and determining effectiveness. Paper presented to the American Education Research Association Annual Meeting, Toronto, Canada.

National Association of Nurse Anesthetists. (1937). Revised report of the educational committee. The Bulletin, 5(2), 301-310.

Newell, A. (1966, June). On the analysis of human problem solving protocols. Paper presented at the International Symposium of Mathematical Computational Methods, Rome, Italy.

Nie, N., Hull, C., Jenkins, J., Steinbrenner, K. & Bent, D. (1975). Statistical Package for the Social Sciences (2nd ed.). New York: McGraw-Hill.

Provus, M. (1971). Discrepancy evaluation for education program improvement and assessment. Berkley, CA: McCutchan.

Rose, C. & Nyre, G. F. (1977). The practice of evaluation ERIC/IM report 65. (ERIC Document Reproduction Service No. ED 152 859)

Rotem, A. & Bandaranayake, R. (1981). Difficulties in improving medical education: A framework for analysis. Higher Education, 10, 597-603.

Sarason, S. B. (1971). The culture of the school and the problem of change. Boston: Allyn & Bacon.

Sirois, H. A. & Iwanick, E. F. (1977). Delphi-discrepancy evaluation: A model for the quality control of federal, state and locally mandated programs. (ERIC Document Reproduction Service No. ED 137 321)

Statutes of California. (1971). Assembly Bill 293, p. 727.

Steinmetz, A. (1976). The discrepancy evaluation model. I. Basic tenets of the model. Measurement in Education, 7(1).

Steinmetz, A. (1976). The application of the DEM to an educational program. Measurement in Education, 7(2).

Stufflebeam, D. (1977). Needs assessment in evaluation. Paper presented at the American Educational Research Association Evaluation Conference, San Francisco, California.

Taba, H. (1962). Curriculum development. New York: Harcourt Brace, Dovanovich.

Tasch, E. G. (1977). Utilization of the discrepancy analysis system in the organizational development of teaching problems solving at the University of Louisville School of Dentistry. (ERIC Document Reproduction Service No. ED 144 842)

Thatcher, V. S. (1953). History of anesthesia with emphasis on the nurse specialist. Philadelphia: J.B. Lippincott.

Torres, G. (1974). Curriculum evaluation for today and tomorrow. In Faculty-curriculum development: Part II curriculum evaluation. New York: National League for Nursing, pp. 15-24.

U.S. Congress. House. (1965). Elementary and secondary education act of 1965. (Pub. L. 89-10, 89th Cong., 1st sess., Vol 79, pg. 27). Washington, DC: U.S. Government Printing Office.

Weddington, D. (1973). Needs assessment for continuous curriculum revision.(ERIC Document Reproduction Service No. ED 158 826)

Weller, L. D., Ahnell, I.V. & Reynolds, J.C. (1983). Discrepancy analysis: A quantitative technique for curriculum development. The Clearing House, 56(5), 223-229.

Abstract

A QUANTITATIVE METHOD FOR DETERMINING
CURRICULUM GOALS IN
NURSE ANESTHESIA EDUCATIONAL PROGRAMS

by

Mary R. Stewart Vidaurri

May, 1984

Advisor: Donald Marcotte, Ph.D.
Major: Educational Evaluation and Research
Degree: Doctor of Philosophy

The research problem this study investigated is: First, is there a discrepancy perceived between educational goals that are currently met by the minimum academic requirements of the Council on Accreditation and the importance of goals being met in the future when a baccalaureate degree is required as an entry requirement for all nurse anesthesia programs? Second, can the employment of a discrepancy evaluation technique supply a quantitative data base to assist decision makers in developing future academic curriculum requirements in nurse anesthesia educational programs?

The entire population of certified registered nurse anesthetist (C.R.N.A.) program directors throughout the United States was included in this study, however, 116 subjects or 85% of the population responded. This study utilized the discrepancy analysis technique to evaluate 41 educational goals for the nursing specialty of anesthesia. The data collection instrument was critiqued and rated by a delphi group for the purposes of establishing validity and reliability. The Pearson product moment correlation

coefficients for the instrument's measurement of present goal obtainability and future importance of the goal were .88 and .79 respectively at $p < .01$. Results demonstrate that C.R.N.A. program directors perceive discrepancies between the extent the 41 educational goals are met by the minimum academic requirements of the Council on Accreditation and the extent they should be met in the future when students enter all nurse anesthesia programs with a baccalaureate degree. A comparison of the rank order of goals by their mean rating of future importance, with their rank order by mean size of discrepancy, provides a mechanism to prioritize areas needing change within the academic curriculum. Although the goals are ranked by future importance ratings, 38 of the 41 goals had mean ratings on this scale above 5.0, indicating they were all perceived as highly important for the future. Analysis of variance and application of the a posteriori Duncan multiple range test indicated that on several goals there were significant differences between ratings by certificate, baccalaureate, and masters program directors on present goal obtainability, the future importance of the goal, or the discrepancy. These findings should be used to initiate the process of making revisions in the academic requirements. Curriculum goals of these requirements should reflect the educational goals that C.R.N.A. program directors have identified as needing change, and as important goals for the future, when students enter all nurse anesthesia programs with a baccalaureate degree.

Autobiographical Statement

Mary R. Stewart Vidaurri obtained her bachelor of science degrees in Nursing and Anesthesia, and her master of science degree in Anesthesia from Wayne State University. She is chairman of the American Association of Nurse Anesthetists (A.A.N.A.) Education Committee as well as a member of the Council on Accreditation of Nurse Anesthesia Educational Programs/Schools, where she serves as chairman of the Professional Relations Committee. Mrs. Vidaurri has also served as an educational consultant and senior on-site accreditation visitor for the Council on Accreditation. In addition to membership in the A.A.N.A., she is a member of the American Nurses Association and the American Educational Research Association, where she belongs to the Measurement and Research Methodology Division and the Post Secondary Education Division. She has published several anesthesia clinical papers, and has lectured at national meetings and workshops on the topics of program evaluation and evaluation tools. Mrs. Vidaurri is currently the Director of the Henry Ford Hospital/University of Detroit Program of Nurse Anesthesia and is an adjunct faculty member of the College of Engineering and Science at the University of Detroit.