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A study of variables essential for success in an information management post-secondary curriculum /

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A STUDY OF VARIABLES ESSENTIAL FOR SUCCESS IN AN INFORMATION MANAGEMENT POST-SECONDARY CURRICULUM

by

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DEDICATION

To my Mother - who always knew I had it in me. It's finally done, Mom!

To my Daughter, Kati - whose love made me get through it.

To Betty - whose patience and friendship is something many crave for, but are not fortunate enough to have.

To Karen - who has always believed in me.

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TABLE OF CONTENTS

PAGE

LIST OF TABLES

LIST OF FIGURES

CHAPTER ONE

"The shrewd guess, the fertile hypothesis, the courageous leap to a tentative conclusion - these are the most valuable coins of the thinker at work." (The process of education - Jerome Bruner 1915)

INTRODUCTION

The current emphasis within the educational process of the Health Information Management Association is to have a competency-based curriculum. The challenge, for the educator, is to develop this curriculum and define "quality" and "accountability" as mandated by the Health Information Association. Accountability should be demonstrated through assessment and should consist of proof from the institution that the student received within the educational process, what the institution says they did. The demands of the profession, and its requirements for accountability, is what made this research come about. The importance of identifying specific characteristics essential for success in the Health Information educational process is a must. Theses characteristics will become the standards that will be increasingly used as a yardstick for competency and will identify professional leadership as we approach the 21st century.

"The direction in which education starts an individual will determine their future life. " (Plato)

Baker College's Health Information Technology and Administrative programs were patterned after this philosophy. The primary goal was to produce competent individuals who met the mastery skill levels and were ready to enter the Health Information Management profession. Thus, the challenge to identify the essential characteristics for success in the profession became the hypothesis for this dissertation.

Management profession. The following were investigated: previously identified research, post secondary academic characteristics, and cognitive measures in the Health Information School Curriculum programs and the National Certification Examination.

A HIT program and its graduates of a midwest, not-for-profit, private college were used as the base for the identification of the characteristics, cognitive measures, and variables. The areas identified were: the ASSET scores from the participating college, the grades from the college science and HIT courses, the cumulative GPA at graduation, and age. The characteristics were the independent variables. The dependent variable was the National Health Information Management Certification Examination scores.

There were three classifications of students: 1) individuals who tested low on the ASSET test and required developmental classes; 2) individuals who tested low on the ASSET test and who did not complete developmental classes; 3) individuals scoring high on the ASSET test who did not require the developmental courses.

The Research Analysis included the independent variables of General Science and HIT, the ASSET test scores, the college grades, and the cumulative GPA at graduation to the dependent variable of the National Health Information Certification Examination scores.

The analysis identified the strengths and weaknesses of the post-secondary HIT curriculum by comparing these variables with the National Health Information Certification Examination scores. The analysis helped to establish for the profession a basic yardstick for the institution and the faculty in the post-secondary Health Information Management programs, and assisted in the identification of the necessary cognitive variables a prospective student should possess in order to be successful in the Health

Information Technology curriculum. Finally, the analysis identified whether there is a need to complete developmental courses prior to acceptance into the HIT core curriculum for the prospective students who initially score low on the ASSET test.

Statement of the Problem

The problem was to identify, investigate and evaluate characteristics essential for each student to achieve success in the Health Information post-secondary curriculum, the National Certification Examination, and the profession of the American Health Information Management Association.

If the analysis was statistically significant, these variables would assist educators in the Health Information Technology post-secondary programs throughout the country to identify potentially successful candidates on admission to the college. Any problem arising was in the documentation within the graduate files, the ASSET scores, transcripts, and identification of the student scores on the National Certification Examination (Slovensky, 1994).

Statement of Purpose

The purpose was to investigate, identify and evaluate measurable, realistic, and obtainable variables regarding characteristics associated with academic success in the Health Information Technology programs. Once identified and evaluated, an analysis of these variables combined with the results of the National Certification Examination scores could assist in predicting success in the post-secondary curriculum of the Health Information Technology programs. The results obtained will assist college admission departments and Health Information Technology faculty in establishing parameters for selection of qualified candidates for admission to the programs, including the identification of students at risk.

This evaluation was undertaken after investigation failed to reveal success from previous research to reveal the appropriate variables from data accumulated on former students, in specific HIT programs. This case study draws the data from the graduates files in the Health Information Technology program and the results of the American Health Information Associations National Certification Examinations between 1988 and 1993.

In an effort to increase the success of this evaluation, this research was based on the competency-based HIT curriculum previously established.

Researchers within the profession, like Slovensky, Osborn and Eichenwald, during the Assembly of Education meeting in Chicago, Illinois in July, 1994, indicated that there is an urgent need for these cognitive variables to be verified. Sansom states, "It is becoming a necessity for the selection process at the university level, since the attrition rate has grown to 17% nationally, and a low to 59% passing rate on the national certification examination" (Sansom, 1993).

Graham (1990) defines "Quality Assessment as encompassing the professional, technical and personal skills individuals must possess to complete a specific task, live a good life, or succeed in their profession. This research analysis has the ultimate goal of the establishment of a quality assessment program to evaluate whether potential students have developed the appropriate skills (entry-level competencies) to be successful."

These quality assessment tools used within the college settings must encompass the criteria, standards and basic elements (Graham, 1990). The elements must include the Domains, Tasks and Subtasks established by the National Health Information Management Association, the entry-level competencies developed by the practitioners and educators within the Association, and the accredited post-secondary schools (Graham, 1990). These

tools must both be essential within the didactic structure of the classroom and applicable in the clinical affiliation settings (Graham, 1990).

The success of the students in meeting these entry-level competencies was dependent upon first, the evaluators, including college faculty, clinical affiliation practitioners and the American Health Information Management Association, second, the entry-level competencies based on the essentials, Domains, Tasks and Subtasks, built into the curriculum as required by the Health Information Management Association, third, the National Certification Examination developed by the practitioners and educators with the American Health Information Management Association's Council on Certification, and Council on Education Guidelines (Council on Certification, 1993). Over the past several years practitioners, educators and the trade association itself have questioned the level of competency the new graduates achieved (Sansom, 1991).

Hypotheses

The following hypotheses were tested:

H_1 There is no statistical significance between the ASSET scores on admission to the college and the passing of the National Certification Examination of the AHIMA.

H_2 There is no statistical significance between a student's grades in the general college science course and the passing of the National Certification Examination of the AHIMA.

H_3 There is no statistical significance between a student's grades in the Health Information Technology core courses and the passing of the National Certification Examination of the AHIMA.

H_4 There is no statistical significance between the ASSET scores, the general science course grades, the Health Information core course grades, and the passing of the National Certification Examination of the AHIMA.

H_5 There is no statistical significance between a student's grade point average at graduation and the passing of the National Certification Examination of the AHIMA.

Assumption

Prior to the completion of the research, acceptance of some basic requirements placed on all college curriculum and the profession through the national association are required as mandated by the American Health Information Management Association and the college. These include:

a. the essentials and competencies of the program are based on the Domains, Tasks and Subtasks established by the American Health Information Management Association;

b. the National Certification Examination is based on the Domains, Tasks and Subtasks;

c. the student must maintain a minimum grade point average of 2.5 within the core courses, affiliation, and at graduation;

d. the entry-level competencies are identified for the student during the college curriculum;

e. the standardized final examination for each core course are based on the essentials;

f. there are assigned projects at the affiliation sites and in the core courses applicable to the entry-level competency;

g. there is a system director whose responsibility is to coordinate the program;

h. there are standardized syllabi; and

i. the Health Information Technology program requirements are copied, reviewed, and signed by the students during their education, including the curriculum, essentials, competencies, school program, DTS and the

American Health Information Management Associations requirements of the National Certification Examination.

Definition of Terms

Accreditation: The process of recognizing that an institution has facilities, policies and procedures that have met established standards.

Administrative Management: Enhances the student's understanding of the management tools utilized in health information science including planning, directing, coordinating, training, and budgeting within the department. Associated with this applied knowledge will be the orientation/analysis of health care administration with respect to the inter- and intrarelationships of the health information department.

Administrative Seminar: Capstone course in Health Information Management. Competency will be demonstrated through application of principles/practices taught in the major core courses, as well as in the general education, and support courses. This will be accomplished through the formulation and presentation of administrative projects, a trend paper, critical analysis and competency-based examinations.

Administration Affiliation I: A four-week supervised learning experience involving the observation and application of managerial techniques within a health information department. The selected HIM site MRA will be one of the following: health maintenance organization, skilled nursing facility, large primary care clinic, home health care agency, health department, rehabilitation center, State Department of Health, law office, or outpatient psychiatric/substance abuse treatment center.

Administrative Affiliation II: An eight-week supervised learning experience involving the observation and application of managerial techniques within health information departments. The selected site will be an acute care facility.

Administrative/Legal Practices: Includes current legislation and advanced legal medical record and personnel management concepts. Projects will include development of policies and procedures which are the responsibility of the Medical Record Supervisor.

Affiliation: An association with an educational institution that allows a specialized program to obtain practical application of skills learned.

Analysis of Variance (ANOVA): A statistical measure of the association between a categorical, independent variable and a continuous, numerical, dependent variable from an interval or ratio scale, used to assess the significance of differences among means for different groups.

Analytical Survey: Takes data that is essentially quantitative in nature and analyzes the data by means of appropriate statistical tools.

Assessment: To evaluate specific standards previously developed by professionals within a specific organization.

Apriori: Proceeding from a known or assumed cause to a necessarily related effect; deductive. Based on a hypothesis or theory rather than on experiment or experience. Made before or without examination; not supported by factual study.

Asymmetrical: Distribution on the bell shape curves leans more to one side than the other. Cluster to left side, positive valuate. Cluster to the right side, negative coefficient.

Basic Human Anatomy: Introduces the student to the structural organization of body systems. Designed for students with limited background in chemistry and biology. Intended for allied health students who need an overview of body systems.

Bivariate (Variable): Shows the relationship of 2 variables.

Cancer Registry: A data system designed for the collection, management, and analysis of persons with diagnoses of cancer.

Categorical Data: Is only nominal data and are not related to one another and there are no points between categories.

Certification: A legal document prepared by an official body that indicates an institution has met certain standards or completed a prescribed course of instruction or training.

Coding/Classification Systems I: Emphasizes basic coding principles of CD-9-CM and introduction to the different types of nomenclatures and classification systems.

Coding/Classification Systems II: Introduces advanced coding principles as well as the prospective payment system. The student also will be introduced to the concepts of Current Procedural Terminology CPF coding.

Coefficient of Determination: The proportion of shared variances is indicated by the square of the correlation coefficient.

Confidence Interval: Is a range around the sample mean based on the SE, only applies to continuous nominal variables.

Continuous Data: Merely numeric data that is arrayed or distributed on some continuum. Interval, ration and ordinal scales can be used with this data base.

Correlation: The relationship between two variables. Statistical descriptions.

Correlation Coefficient: A measure of the interdependence of two random variables that ranges in value from -1 to +1, indicating perfect negative correlation at -1, absence of correlation at 0, and perfect positive correlation at +1.

Correlation Matrix: The correlation coefficients between each pair, for several variables, arranged so that each variable is identified on each row and on each column, with the coefficient listed in the cells defined by the rows and columns.

Criteria: Standard for judging a performance.

Degree of Freedom (d.f.): A parameter most often based on the number of cases or respondents, but slightly reduced to adjust for some earlier computations and used when checking reference tables or computing probability to assess statistical significance.

Dependent Variable: A mathematical variable whose value is determined by the value assumed by an independent variable that is not dependent on other variables.

Depression or Variance: Amount of deviation.

Diagnosis: After the course of treatment, the reason the patient was seen.

Discriminant Analysis: Used when the independent variable is continuous and the dependent variable is categorical.

Elements: The basic assumptions or principles of a subject.

Extraneous: Outside variables, not relevant to process.

F-Distribution: The particular form of a distribution derived from a set of computations and defined by two numbers of "degrees of freedom," often listed in statistical reference tables.

F-Ratio: The ratio of a numerator and denominator value consisting of variance expressed as "mean squares," or the "sum of squares" divided by the degrees of freedom for each, usually computed with analysis of variance and compared to the F-distribution in a statistical reference table to assess statistical significance.

f-Test: Assumes normality of population.

Flexner Report: First standardized review of medical schools in 1911.

Frequency Distribution: The number of cases that contain each of the scale values for a particular survey item or variable.

Health Information Systems: Includes an in-depth study of health statistics (sources, definitions, collection, reporting, presentation, and analysis of data). Special projects, policies, and procedures will be used to enhance the student's ability to use health care data.

Health Record: The document that captures the health information, maintained in a chronological order, related to a particular patient.

Health Record Application: Reinforces previously learned skills through practical experiences.

Histogram: A horizontal bar chart showing the frequency or percentage distribution of response for a survey item in graphic form, often generated by computer analysis routines if requested.

Human Anatomy and Physiology I: Deals with the fundamental study of the body with a view toward the structure and function of body parts, organs, and systems and their relationship to the whole body. Laboratory work may include the use of the

microscope, experiments/ demonstrations in physiologic principles, and the dissection of animal parts.

Human Anatomy and Physiology II: Emphasizes the structure and function of the various body systems. Laboratory work will include the dissection of mammal organs.

Independent: Not dependent on other variables.

Index: An alphabetized listing of names, places and subjects.

Interval Data: A scale with numeric values that are equidistant from one another. No division can be used in this scale because the zero is not absolute.

Introduction to Health Care: Acquaints the student with a variety of perspectives about existing health care systems. A particular emphasis on the complexity of the American health care system will be made. Comparisons with other health care delivery models and national trends will be discussed. Current events are incorporated throughout the course.

Introduction to Health Information: Includes an in-depth study of the origin, use, content, and format of health records; storage and retrieval systems; numbering and filing systems; record retention procedures, accreditation, certification, and licensure standards applicable to health records in all types of settings.

Kurtosis: Indicates how peaked or flat the bell shaped curve is compared to the normal bell shaped curve.

Licensure: A legal permission to do or own a specific thing.

Linear Regression: A statistical measure of the effect of one interval or ratio level variable on another, used both to indicate the statistical significance of the

relationship and to generate an equation to predict or estimate the value of the dependent variable for a new case, based only on the known value of the independent variable.

Mastery: Possession of skill.

Mean: The most common average or measure of central tendency, providing an indication of the most typical or representative value for the sample and the population as a whole, within a given confidence level.

Mean Squares: A value usually computed for analysis of variance to form an F-ratio to assess statistical significance, consisting of the total of the squared deviations from the mean for each data point, or sums of squares, divided by the number of cases or degrees of freedom.

Measurements: Dimensions.

Median: (Middle value) not subjected to outliers.

Medical Record: See health record.

Medicine and the Law: Analysis of ethical/legal concepts in the health care system and the role of the Health Information Department. Evaluation and application of the legal requirements based on rulings from: judicial system, hospital and physician liability, privacy/confidentiality, and risk management. Discussion and identification of problems/conflicts both interpersonal, professional and clientele relationships in regard to issues such as the right to live/die, AIDS, consents, sterilization, abortion, and human experimentation. Emphasis will be placed on safeguarding and protecting the patient's rights, the health records, the practitioner, and the health care facility.

Medical Terminology I & II: Examines the fundamentals of word analysis by body system. This course will place an emphasis on the spelling, pronunciation, and definitions of medical terms.

Microbiology: The study of small organisms and their effects on other life.

Multiple Regression: Linear regression that uses a single dependent variable and two or more independent variables in the same analysis, in contrast to simple, linear regression using only one independent variable, so that both the effect of each independent variable and the effects of interactions among independent variables can be gauged.

Multivariate: Shows the relationship of multiple variables.

Nominal Data: Used for names and have no real value. No mathematical equations can be used on this data.

Ordinal Scale: Uses the median for the interpretation.

Papyrus: A paper made from the stem of a papyrus plant.

Pathophysiology: Deals with the disease processes affecting the human body via an integrated approach to specific disease entities. Diseases will be studied in relationship to their etiology, pathology, physical signs and symptoms, diagnostic procedures, complications, treatment modalities, and prognosis.

PEW: A philanthropic contributor who supported the research for education and the allied health post secondary revision of curriculum and competencies.

Quality Assessment: An in-depth analysis of total quality management (TQM) as it applies to the health care industry. The emphasis will be upon development and implementation of formal review programs in the areas of clinical quality

assessment, utilization review, risk management, and provider credentialing. Quality assessment and improvement techniques specific to health information services will also be addressed.

R-Square (R2 or RSQ): The coefficient of determination obtained during regression analysis, indicating the proportion of variance in the dependent variable that is "explained" by the values of the independent variable.

R2 Equation: Y = A + BX A = ra, B = R2 coefficient, X = given number of the independent variable.

Rank Correlation (Spearman): The statistical method of correlation appropriate when one or both of the variables are from only ordinal level scales, sometimes called Spearman Rank correlation.

Ratio Scale: Has an absolute zero base, is the least restrictive, uses variables that are continuous and are identified as one being independent and one dependent, may use both division and multiplication math and have meaningful results, the numeric values show both order and magnitude, the interval between integer values is equal, a zero value does indicate absence of the thing measured , the values show relationship by order and magnitude, the values can be used to form ratios, and statistical manipulation is not limited.

Registry: A book of official records.

Regression Analysis: A statistical measure of the effect of one interval or ratio level variable on another, used both to indicate the statistical significance of the relationship and to generate an equation to predict or estimate the value of the dependent variable for a new case, based only on the known value of the

independent variable.

Regression Equation: The equation generated by linear regression analysis, expressed as a coefficient that can be multiplied by the value of the independent variable for a new case and a constant to be added, to predict the unknown value of the dependent variable.

Rotation: A motion in which the path of every point in the moving object is a circle.

Scatterplot: A graphic plot of the data points for two variables, usually generated on request by analysis routines during regression analysis, so that each data point is plotted horizontally according to the value of the independent variable and vertically according to the value of the dependent variable.

Shape: Means the form of the distribution in the curve, kurtosis, etc.

Skewness: Measures of degree and direction of symmetry.

Square of the Coefficient: The percentage of shared variance or measurement together is indicated also called the coefficient of determination.

Spread: means the amount of deviation from the central point or average.

Standard: An acknowledged measure of comparison for quantitative or qualitative value.

Standard Error: A computed value based on the size of the sample and the standard deviation of the distribution, indicating the range within which the mean of the population is likely to be from the mean of the sample at a given level of probability.

Standard Error of Estimate: In regression, a computed value that indicates the range within which a value of the dependent variable predicted from the regression

equation is likely to be, from the actual value of the case, at a given level of probability.

Standard Deviation: A computed measure of spread or dispersion in a distribution of data, based on the squared deviations of each point from the mean, that can be used to indicate the proportion of data within certain ranges of scale values when the distribution conforms closely to the normal curve.

Statistical Analysis for Planning: Introduction to the theory practical application of financial concepts essential for effectively managing the Health Information Department. Identifying the usefulness of health data in forecasting the planning is covered. Included in this identification will be the formation of analysis reports and the techniques for calculating meaningful health care statistics for internal and external utilization. Identifying appropriate standards including uniform terminology/definitions; manual/ computerized collection, and displaying/reporting of financial reimbursement is stressed.

Statistical Inference: Means inferences about the population based on a sample statistic; ie: based on a random sample of the population.

Statistical Significance: Determined by the probability that such a relationship would exist in the sample if it did not exist in the population as a whole.

Strategic Planning: An introduction to techniques in strategic/budgetary planning process. Included are the selection, used and control of the necessary equipment, space, and methods needed for the department to function efficiently and the concepts and operational practices of purchasing. This information will be integrated by simulation of a layout office problem and the planning process and

the solution of such. An introduction to concepts related to the application, analysis, planning and use of computers in the health information department including information databases, software application, system selection, storage/ retrieval, retention, and control and an overview of microcomputer application. The course will also address the evaluation of the confidentiality problems facing health information managers with computerization of the record.

Sum of Squares: A value computed for several forms of statistical analysis, such as computing the standard deviation, analysis of variance, regression analysis, and the like, where some mean is subtracted from each data point, this deviation is squared, and the squared values are added for all the cases.

Symmetrical: A bell shaped curve with both sides equal. If the distribution is symmetrical, the coefficient of the skewness is equal to zero.

Tumor: See Cancer Registry.

Value of Skewness: Indicates the degree of accuracy with which the standard deviation (SD) can be used to estimate the amount of spread in the distribution.

Variance: A statistical term referring to the sum of the squared deviations of each data point from the mean (the sum of squares), divided by the number of cases or degrees of freedom (the mean squares), and also the value from which the standard deviation is computed by extracting the square root.

Abbreviations

ACS	American College of Surgeons
ACT	American College Test
AHIMA	American Health Information Management

ALPP	Administrative and Legal Principles and Practices
AMA	American Medical Association
AMRA	American Medical Record Association
AOE	Assembly on Education
APP	Anatomy and Physiology with Pathophysiology
ART	Accredited Record Technicians
ASSET	Assessment of Skills for Successful Entry and Transfer
CAHEA	Commission on Allied Health Education and Accreditation
COA	Council on Accreditation
COC	Council on Certification
CODES	Disease Classifications - Coding I & II
COE	Council on Education
DTS	Domains, Tasks and Subtasks
GGPA	Graduation Grade Point Average
GPA	Grade Point Average
HC	Health Care
HIAM	Introduction to Health Information Application and Management
HIM	Health Information Management
HIS	Introduction to Health Information Statistics
HIT	Health Information Technology
JCAHO	Joint Commission on Accreditation of Health Care Organizations
MR	Medical Record
MRL	Medical Record Librarians

MRLNA	Medical Record Librarians of North America
MRA	Medical Record Administrators
MRT	Medical Record Technicians
MT	Medical Terminology
NCE	National Certification Examination
PPS	Prospective Payment System
QA	Quality Assessment/Assurance
RRA	Registered Record Administrators
TABE	Test of Adult Basic Education
TEFRA	Tax Equity Fiscal Reform Act

Significance of the Study

The Health Information Management Association embraces the concept that the Health Information Department, which handles the health record, is one of the most vital within a health care setting (Skurka, 1994). Accuracy, timeliness and order are essential in dealing with Health Information. These components are essential in the assessment of quality care, maintaining low liability, achieving accreditation, reimbursement and financial security within the health care facility (Cofer, 1992). Cofer also states that the Health Information Technologists and Administrators leading these departments must possess skills that will successfully promote a sound working environment, demonstrate interpersonal and intrapersonal communication skills when dealing with employees and other members of the allied health teams, and must demonstrate these entry-level competency skills through the National Certification Examination upon graduation from their post-secondary institution.

The appropriate entry-level competencies that the health information professionals need are under continual query by practitioner, educator, and the association. Additionally, which entry-level competencies are most essential has been debated unsuccessfully since 1979 (Eichenwald, 1981).

Investigatory studies dating back to 1979 by specific researchers such as Gupta, Eichenwald, Osborn, Plevak, Sansom, and Slovensky have attempted to identify the cognitive characteristics that students must possess. Many different types of research surveys, dissertations, and questionnaires have been undertaken to identify the previous variable combination necessary to promote success (Kuyper, 1985). But up through the present day, no variable combination has been substantiated that can identify for educators, the college, or the Association the right combination of characteristics that identify the successful candidate (Slovensky, 1993).

Limitations of the Data

Gathering the research data was dependent upon the completeness of the student's academic record. The essential information include: the Assessment of Skills for Successful Entry and Transfer (ASSET) placement scores; the grades received in General Science and HIT core courses; the accumulative grade point average on graduation; and the scores from the American Health Information Management Association and the National Certification Examination.

The ASSET test scores are prerequisites for entrance to the college and the Health Information Technology program, with the exception of transfer students, as required by the college. Students who transfer into the college must have taken the ASSET test at their previous institute of education. There was no review of prerequisites prior to the

HIT core courses. All prerequisites are required courses that must be completed in order to enter the core courses with a minimum GPA of 2.0. Students not achieving these GPA;s in the prerequisites are not allowed to continue tin the HIT program. Each requirement is verified quarterly by the Health Information Technology faculty team.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

The intent of this literature search was to scrutinize earlier research for identification of variables, potentially workable, to support and justify this dissertation.

A Historical Perspective

The science of Health Information Management, prior to 1992, was referred to as the Science of Medical Record Administration (Skurka, 1994). The profession established in 1928 under the guidance of the American College of Surgeons and the American Medical Association, a new concept for documenting quality of care rendered by physicians (Huffman, 1980). Prior to these guidelines and standards established by the American College of Surgeons (ACS), the health (medical) record, as we know it today, was almost non-existent (Huffman, 1972).

History is replete with examples of the evolution of medicine throughout the development of man, and mentioning the fact that health records were maintained was only because a few individuals personally opted to do so (Skurka, 1988).

In tracing the development of the health record, there is documentation as far back as the Egyptian era with the discovery of the papyrus script found in the caves of the ancient ruins. This discovery demonstrated to the archaeologists that individuals, even during the early development of man, were monitoring the quality of care issue (Huffman, 1972). The only other documentation, according to Huffman (1972), remained in the hands of the physicians, which if completed, was maintained for scientific teaching, research, personal diaries, and documentation of important discoveries. It was not until the late 18th and early 19th centuries that, during the American Revolution, the issue of

accurate and complete documentation of the quality of care surfaced in the health records (Huffman, 1980). Historically, Benjamin Franklin produced many of the earliest health records, in his own handwriting, when he established the first incorporated Pennsylvania Hospital in 1752 (Huffman, 1972). However, even though this health record documentation began in 1752, most hospitals for the first fifty years used the health records only as registries. Hospital administration required that the health records contain the name, address, diagnoses, and admission/discharge dates of each patient (Huffman, 1985). These early health records are presently maintained and preserved in the archives of Pennsylvania Hospital in Philadelphia, Pennsylvania (Huffman, 1972).

From the early 19th century onward, many of the other newly constructed hospitals followed the guidelines established by Franklin and Pennsylvania Hospital, by requiring written documentation of the medical and surgical cases (Huffman, 1990). Setting the pace for further use, both the New York Hospital in New York City, New York, and Massachusetts required patient registries, as well as the first complete clinical health record on every patient (Huffman, 1990). From these registries and the health records, the United States established the first national data bank for disease control and operation indices that are still maintained at the Center for Disease Control in Atlanta, Georgia (Skurka, 1994). These health records became the yardstick for the documentation and evaluation of research, medical science technology and their respective discoveries.

Health records today are primarily used as the documentation tools to evaluate the quality of care rendered to patients in both the public and private sectors of health care (Skurka, 1990). The role of the health record has evolved in the United States because of

the public's increasing demands for accountability from the Health Care Practitioners, with respect to the quality of care issue. As far back as 1911, in the famous Flexner Report, Flexner investigated and laid bare the sad picture of the many inferior medical schools incapable of providing acceptable medical education and competent practicing physicians (Huffman, 1980).

Backing Flexner was the Carnegie Institute Foundation (Huffman, 1980). The investigation revealed that certain individuals were able to obtain degrees in medicine within six months. Medical schools that were turning these incompetent physicians out were nicknamed appropriately "the diploma mill schools" (Huffman, 1972).

Alerted to these discrepancies in 1913, through the Flexner investigation, the American College of Surgeons (ACS), under the leadership of its founder, Dr. Franklin Martin, decided that it was their responsibility to eliminate this process and raise the entry-level competency and standards of their practicing surgeons, thereby making the surgeons accountable for their actions (Huffman, 1985). Therefore, the American College of Surgeons mandated, in 1913, that these entry-level competencies, standards and essentials serve as the first set of guidelines for a national hospital accreditation program. These guidelines were developed with the understanding that the primary responsibility would be in assisting in the identification of adequately licensed acute health care facilities and competent physicians (Huffman, 1990). This program went on to support the concept that the most appropriate way to evaluate the practice of the surgical candidates was by reviewing the documentation of their surgical care rendered within the health care record. This process was established by setting specific predetermined guidelines and standards of documentation that must be included in all surgical cases health records. This concept

was the first quality assessment tool ever used in the Health care Industry and is still in use today (Huffman, 1972).

After the first study was concluded, it was apparent to the American College of Surgeons that there was a major deficiency with the lack of documentation in the health record and, therefore, the conclusion was reached that the standard of care was substandard (Huffman, 1972). When the American College of Surgeons published these results, the general public was shocked to discover that only 1.6 percent, or 89 out of 5,323 licensed hospitals met the basic guidelines (Huffman, 1972). Therefore, because of the mandatory predetermined guidelines and standards established by the American College of Surgeons (ACS) and the devastating Flexner report, a proposal was adopted in the House of Delegates of the American College of Surgeons that required an "accurate and complete surgical health (medical) record be written on all patients and filed in an accessible manner within the hospital" (Huffman, 1980). By establishing these minimum requirements, the American College of Surgeons (ACS) established the first medical record department, the first set of policies and procedures and the beginning of the medical record profession (Skurka, 1988). These guidelines and standards are still used within the quality assessment programs in all health care facilities, as originally required by the American College of Surgeons in 1918, even though medical science has advanced far beyond the practice of medicine in 1913.

Association Inception

As the positive momentum grew for the adoption of the predetermined essentials and guidelines for evaluation of the quality of care, MacEachern, then a member of the American College of Surgeons, issued a special invitation to practicing medical record

workers in the United States and Canada to attend a joint meeting in Boston Massachusetts with the American College of Surgeons (Huffman, 1972). The entire meeting was devoted to the establishment of the policies and procedures that would be applicable to practice the science of medical record administration. Included with these policies and procedures were items such as conformity, consistency, protection, accuracy and guardianship of these health records (Skurka, 1988). MacEachern invited Grace Whiting Myers, the Director of the Medical Record Department of Massachusetts General Hospital, to be chairperson to organize the joint meeting, direct the program and plan the exhibits (Skurka, 1988). At the close of this initial joint meeting on October 11, 1928, Mathew W. Foley, editor of Hospital Management and Father of National Hospital Day, made a proposal to the American College of Surgeons House of Delegates that the medical records specialists organize to promote the science of medical record administration throughout the United States and the world (Huffman, 1980). This was unanimously agreed upon by all members of the House of Delegates and from this proposal, the first Association of Record Librarians of North America was established. Grace Whiting Myers was elected president; Frances G. Babcock, Director of the Medical Record Department of the University of Michigan Hospital, Ann Arbor, Michigan was elected treasurer; and Frances Benson, Director of Medical Records of Bryn Mawr Hospital, Philadelphia, Pennsylvania, elected secretary (Huffman, 1972). The goal of this newly formed association was to "evaluate the standards of the health (medical) record within the health care environment" (Skurka, 1988).

As the profession thrived, individuals employed in these medical record departments learned their trade through apprenticeships (Huffman, 1972). But in 1935,

with the increasing demands placed upon the association, the membership and the medical record department; and the continually growing list of guidelines, standards, elements and responsibilities for the medical record departments and their managers for the completion of the medical record; the association recognized the need to develop a formal educational curriculum as a necessity to practice the art of medical record administration (Huffman, 1972). Subsequently, in 1935, under the leadership of Jean Harned Bufkin, Director of Medical Records at Rochester General Hospital, a curriculum was developed for hospitals who were interested in a Medical Record Administration four-year school program. Four such hospital-based schools opened in 1935:

Massachusetts General in Boston, Massachusetts, began under the watchful eye of Genevieve Chase; Rochester General Hospital in Rochester, New York, under the leadership of Jean Harned Bufkin; St. Joseph's Hospital in Chicago Illinois, under the leadership of Edna K. Huffman; and St. Mary's Hospital, the only program affiliated with a college, under the leadership of Sister M. Patricia, O.S.B. in Duluth, Minnesota. This last hospital program, in association with St. Scholastica College, was the first to offer a baccalaureate degree in Medical Record Administration (Huffman, 1980).

Curriculum

From the beginning, the Medical Record Administration's four-year curriculum consisted of the classical courses including medical record science, medical terminology, anatomy/physiology, pathophysiology, disease processes, microbiology, chemistry, management, medicolegal concepts, biostatistics, finances, and administrative affiliations. originally, the four-year graduates completed the program with minors in the humanities, social sciences, language and philosophy (Huffman, 1972).

At first the trade association insisted that with the four-year Medical Record Administration program, there was an adequate number of graduates to sustain the demands of the profession. But by the year 1951, due to the shortage and the demand for qualified technically skilled individuals, the Association realized a need for a technical component within the organization. This component developed into a two-year technical curriculum that would provide skilled individuals to complete the technical functions within the Medical Record Department, under the direction of the Medical Record Administrator (Huffman, 1980). Within a year, 1953, the American Medical Record Association had unanimously approved the two-year curriculum and the first post secondary school for an Accredited Record Technician opened. This technical curriculum included medical record applications, medical terminology, transcription skills, basic anatomy/physiology, disease processes, pathology, indexing, formatting, abstracting, statistical application, and coding with a clinical externship under the guidance of a Medical Record Administrator faculty instructor and a clinical affiliation practitioner (Huffman, 1980).

Since the development of both the two and four year curricula, many required courses have been added to the technical and administrative programs. The courses include management and personnel supervision, biostatistics, advanced classification evaluations, human relations, psychology courses on death and dying, assertiveness, and advanced computerized skills, including system design and database programming to achieve maximum computerized entry-level skills. The most recent addition of computerized skills in the curriculum is due to the development of the computerized health care record. The health record will be paperless and will require new challenges for the

leaders in the Health Information Management profession (Skurka, 1994).

Professional Qualifications

As the medical record profession continued to experience growth in its professional status, agreement was reached among the educators, practitioners and the AHIMA that a yardstick for measuring the competencies of the graduates must be undertaken and developed. The AHIMA developed a national certification examination, based on essentials established by the association (Slovensky, 1986). The competencies required all graduating Health Information (Medical Record) Administrators and Health Information (Medical Record) Technicians, at the completion of their formal education, to successfully pass a national certification examination in order to receive their certification and/or registration (Huffman, 1990). These exams were developed under the leadership of the Councils on Education (COE) and Certification (COC) within the American Health Information Management Association. The original intent of the examinations was to determine if a graduate had acquired the appropriate knowledge and had the entry-level competencies essential to perform at the managerial and/or technical levels, according to the essentials with pre-established passing score proficiency (Skurka, 1988).

Association Name Change

In tracing the development of this organization over the past sixty years, the association has grown out of its original name of the North American Medical Record Librarian. The major initiatives to begin the name changes were the continually upgrading of responsibilities placed on the professionals; the ever changing demands of the health care environment, including the most recent changes in the prospective payment reimbursement programs through the federal government; and the computerized,

paperless, health record. These significant issues forced the membership to redesign its appearance and expand its role in health care, for survival if nothing else, by modernizing the concept of the Health Information professional. According to Osborn, (1986), "the Association in changing its name is trying to maintain and advance its position as the leader in the science of Health Information Management." The first change occurred with the decision reached by the House of Delegates at the National Convention in 1970, so the profession would more adequately identify the science (Osborn, 1986).

During the 1970 national convention in San Antonio, Texas, the House of Delegates unanimously agreed to change the name from the Association of Record Librarians of North America to the American Medical Record Association. It was determined that this name more adequately addressed the responsibilities of the association and assisted the professionals in informing the health care industry and the public about the profession. It acknowledged the separation from the professional group of medical librarians and established the Association as an intricate part of the management team in the health care delivery environment (Osborn, 1986).

The Association's name remained until early 1992 when, again, the membership felt the need to be innovative and reflect the integration of computerization, quality assessment, and management as an intricate part of the profession. Therefore, in 1992 at the national convention, the House of Delegates unanimously agreed to change the name of the organization to the American Health Information Management Association (Skurka, 1994). The change was largely initiated because of the role the Association has in the development of a computerized health record, the partnership with the Federal Government in health care reform and reimbursement, and the maintaining of

confidentiality of the health record (Skurka, 1994). It was time the profession was recognized as the authority in the development, security, liability, timeliness, quality assessment, and appropriate use of this health record (Skurka, 1994).

The Health Record

The health information record is the lifeline of the health care industry (Huffman, 1990). The health record, electronic, paperless or in hard copy, contains health information describing all aspects of patient care (Skurka, i994). Health care providers require this information be kept to adequately treat and evaluate patients (Huffman, 1972). Unfortunately, in this overburdened, constantly changing, life-threatening health care environment, even though the health record is essential, the process of documentation is often a secondary consideration to the health care practitioner (Huffman, 1990). Consequently, the challenge of the health information manager, in the 21st century, is to create and maintain an environment that assists the health care practitioner in the completion of this task in the least laborious manner. This responsibility for the health information manager is not a simple challenge (Skurka, 1994). The health record today is a tool that is used by all healthcare practitioners to compile pertinent facts about patients (Skurka, 1994). The health record requires completion in a timely manner, must contain sufficient data to identify a patient, support the diagnosis or reason for the medical care encounter, justify the treatment, and accurately document the results of care, all under the careful leadership of a Health Information Administrator within guidelines established by multiple regulatory agencies throughout the United States (Huffman, 1990). The health record serves as a communicator, as a legal document in the judicial system, and as a protector of the legal interests of the patient, providers and healthcare institutions

(Huffman, 1980). The health record supports the healthcare facilities in substantiating reimbursement claims and is a support document for research, education, accreditation, licensure, certification, and quality assessment (Skurka, 1994).

Through all of this and with the constant changes in the healthcare industry, the health record has remained somewhat of a dichotomy. Its information is essential, but the process of documentation is ever changing (Skurka, 1994). It becomes the responsibility of the American Health Information Management Association and the Health Information Management practitioners to create a health information system that assists in compiling complete and accurate health records with the most up-to-date equipment and maintain the essentials of all outside regulatory agencies without flaw (Skurka, 1994).

Baker College Historical Perspective

Baker College opened its Health Information Technology program in 1987, after the completion of a needs assessment in conjunction with the community, local health care professionals, and hospital administrations, who had originally approached Baker about the curriculum to benefit their employees. The college, after receiving a positive needs assessment, developed its Health Information Technology Advisory Board to assist in the initial evaluation of the Health Information Technology program.

The mission of Baker College is to provide a quality education which enables graduates to be successful in challenging and rewarding careers.

To this end, the following purposes have been established:

1. To prepare the student for competency in business, technical, and allied health careers in today's global economy.
2. To provide general education which expands the student's horizons,

develops strong communication skills, and encourages critical thinking.

3. To give the student practical experience and training in a chosen field of study.
4. To encourage social and classroom related activities which promote the student's personal and professional growth.
5. To assist graduates in securing employment and improving career opportunities.
6. To encourage graduates to continue their education.

With this mission and purpose in mind, the Health Information Management programs were established to assist, enhance and support the development of the competency-based curriculum that would identify individuals who would successfully master the essentials by focusing on the domains, tasks and subtasks (DTS), as directed by the American Health Information Management Association. These programs were accomplished by utilizing a competency-based curriculum that included:

1. Assessing each students knowledge by:
    a. determining appropriate qualifications for entrance to the program;
    b. reviewing ASSET scores; and,
    c. establishing appropriate testing, portfolios, and clinical affiliations.
2. Creating a program that is practical and realistic.
3. Broadening the student's education with the introduction of health information concepts from the field of studies including law, financial, managerial/supervision, humanities, and healthcare reform as it pertains to the healthcare industry.

4. Increasing the student's competencies by practicing their newly-learned entry-level competencies in a simulated, protected atmosphere.
5. Exposing the student to clinical affiliation experiences to further master their competencies.
6. Familiarizing students with the essential tools that will increase their ability to develop, evaluate, analyze, direct and problem-solve critical issues that arise in healthcare over the next decade.

After meeting the guidelines required by the American Health Information Management Association, the two-year Health Information Technology program was introduced in 1987 and received its accreditation in 1989 (AHIMA, 1989). During the six years, the program expanded with the addition of the Health Information Technology on four out-reach campuses in the southeastern part of Michigan including Mt. Clemens, Port Huron, Auburn Hills, and Owosso, Michigan. In 1994, one more out-reach campus was brought into the system accreditation. This additional accreditation approved six campuses: Mt. Clemens, Port Huron, Auburn Hills, Owosso, Muskegon and Flint, each receiving system-wide accreditation by the American Health Information Management Association in 1994 for eight years (AHIMA, 1994).

Baker College, in addition, pursued and received the accreditation of the four-year baccalaureate degree program with the national American Health Information Association in 1994.

HIT-Program Characteristics

The Baker College Health Information Technology program, has continued to upgrade and expand the program to include six campuses throughout the college under the

watchful guidance of the Health Information Technology and Management Advisory Boards and a System Program Director.

The two-year Health Information Technology program has a curriculum directed toward technological entry-level competencies, and upon graduation with successful completion of the American Health Information Management certification examination, may assume entry-level positions in the field of Health Information Technology.

The curriculum for the two-year Health Information Technology post secondary program was developed according to the guidelines established by the American Health Information Management Association (AHIMA), and the Commission on Allied Health Education and Accreditation (CAHAE). Individuals graduating from the two-year program have successfully completed the basic entry-level competencies essential to qualify for the national certification examination and with successful completion of the examination, are qualified to obtain an entry-level position in a health information management department in a healthcare setting.

The program's philosophy was developed in accordance with the mission of Baker College which states in part:

> "To provide a quality education which
> enables graduates to be successful
> throughout challenging and rewarding careers" (Baker, 1994).

In 1991, a second needs assessment was completed and the foundation was laid for the establishment and subsequent development of the baccalaureate degree curriculum in Health Information Management. According to Baker College, this advancement would afford the student the opportunity to continue his/her education and eventually qualify for the national registration examination to become a Health Information (Registered Record)

Administrator. While in process, the North Central Association of Colleges and Schools mandated the establishment of a total system-wide quality assessment program, which with the requirements from the Committee on Allied Health Education and Accreditation (CAHEA) for outcome-based curriculum, supported the advancement of the programs. These mandates from North Central and CAHEA enabled Baker and both the Health Information Management programs the opportunity to individually develop their assessment program across the six campuses. This enabled the System Program Director to identify the characteristics students need to successfully complete the program.

Since the Summer of 1989, the Health Information Technology program has graduated 237 students. Baker College, because of its "open door admission" policy, has had an exceptionally large student population. These students are required to maintain an overall grade point average of 2.5 on a 4.0 scale with the average overall grade point average presently upon graduation of 3.3. The Health Information Technology curriculum consists of 97 hours, 44 considered to be core health information technology science hours. While there have been some minor curriculum revisions, the credit hours and core courses have remained relatively constant. The program requires six quarters of course work and two summers of clinical affiliations to practice the newly acquired entry-level competencies and techniques. on the completion of the curriculum, clinical affiliations and graduation, the students are eligible to write the American Health Information Management Associations national certification examination.

Research Evaluation

The education of a Health Information Management professional is, and has been, a topic discussed by educators and practitioners since the early 1980's (Osborn, 1986). In

1984, the American Health Information Management Associations, House of Delegates met to discuss major issues surrounding the education of the professionals. C. E. Osborn questioned whether tomorrow's practitioners would possess the entry-level competencies necessary to meet the demands of the challenging and rapidly changing health care environment. Osborn identified specific characteristics, such as lack of basic communication skills, inadequate math preparation and problem solving techniques, as the most common deficiencies in college students. Additionally, Osborn, discussed the outdated Health Information Technology post secondary course requirements (Osborn, 1986).

In an unpublished survey at the 1984 Educators' Workshop of the American Health Information Management Association, the educators identified that the major impact on curriculum was the rapidly changing health care environment and was the major concern facing the post secondary curriculum in the college programs.

The educators' major curriculum issues were the short time frames allowed to investigate, develop and integrate the new information and principles in computer technology, financial reimbursement, quality assessment and risk management.

Another major concern was the outdated textbooks and qualified Health Information Management educators.

As the Health Information Management Association approaches the 21st century and the demand for more competent graduates in the profession becomes critical, it is essential that researchers identify the characteristics essential for the student's success. These characteristics then will assist the Health Information college faculty in the identification of successful college candidates for the Health Information Technology and Health

Information Management programs throughout the United States.

Slovensky (1994) suggested that there are cognitive measures that can be used for identifying successful academic performance. These measures are restricted class sizes, school or program admission policies, and social (sometimes legislative) mandates that will assist in motivating allied health educators to seek supplements to the cognitive measures.

Gupta (1991) discussed the attrition data collected by CAHEA during 1989 and 1990, which indicated the Health Information Technology programs experienced a rate of 17.4 percent and since this rate was so high and costly, in terms of time and money spent by both students and faculty, it was advantageous for Health Information educators to try to closely predict student success or failure based on readily available assessment information.

Tompkins and Harkins (1990) identified variables in three areas including the grade point average, which was significant in estimating the certification examination score; the number of years since formal schooling; and the aptitude examination scores.

Balogun (1988) discovered a significant correlation between academic achievement measured by performance on a comprehensive Health Information Technology application examination prior to graduation; a pre-professional grade point average; and an admission interview. The Balogun study was most significant in predicting success based on the pre-professional grade point average.

Studies by Plevak (1984) and Slovensky (1986), both specific to the Health Information Technology and Health Information Administration programs, reported the cognitive scores on the Test of Adult Basic Education (TABE) as significant in predicting

program success. These scores indicate the student's basic skills in reading, language, and mathematics. They discovered these basic skills were significant in predicting success prior to entrance into the post-secondary health information technology/management programs. Nevertheless, Slovensky, when asked the next question (1986), still was not sure "which cognitive measurement, or which test, is most intrinsic as to predicting success in a given academic situation."

Kuyper (1985) first used a cohort of 153 graduates from a Health Information Management program and applied the Harris index of efficiency to the composite raw scores. According to Kuyper (1986), the Harris index employed a coefficient, the squared Pearson product-moment correlation between the total test score and an indicator variable for pass/fail, to measure the discriminate ability of the test. The definition of the efficiency rate, according to Kuyper (1985), is the percentage of correct items at which the test best discriminates between pass and fail categories. The efficiency point reported was approximately 72.5 percent.

Kuyper and Dziuban (1984) sought validation of the Registered Record Administrator's examination efficiency point by using a sample of 1,989 students from ten Health Information Management programs chosen to represent all geographic regions in the United States. The efficiency of this study was between 70 and 75 percent.

In Slovensky's (1994) research, the results indicated that a comprehensive examination administered prior to graduation was another strong predictor of success on the American Health Information Management National Certification Examination. The recommendation from the study was that faculty should require remediation and

retesting when students score lower than 70 percent overall on the comprehensive examination or on any subtest portion of the pretest.

Shirley Eichenwald (1981) indicated that personal interests and personality factors have long been recognized as significant elements in career selection. It seemed appropriate that our profession attempt to gain insight into the types of people who seek to become Health Information Management professionals and who find satisfaction in the profession. In addition, as we experience diversification in the functional levels of Health Information Management, the desire to know if there are differences in the types of people who find job satisfaction at one level versus another is significant for placement of the students in clinical affiliations, as well as employment.

Eichenwald, (1981), collected data that addressed these questions and tested the feasibility of developing a profile of a Health Information Administrator, which could be used nationally to predict career satisfaction within the Health Information profession. The study indicated that an individual with a high interest in Business Management, who preferred well-ordered environments and liked systematic verbal and numerical activities, would find satisfaction in Health Information Management.

The development of a personal interests and personality factors profile of a Health Information Administrator was only addressed by one of the twenty-two researchers.

Sansom (1993), Director and Assistant Professor of the Healthcare Information Programs at Western Kentucky University, Bowling Green, Kentucky, in her article, evaluated ways of successfully selecting and retaining students in the Health Information Technology program. The multiple regression analysis completed indicated that the high school grade point average and the composite American College Test (ACT) score were

the best predictors of overall performance on the accreditation examination, even though the relationship was not statistically significant. Using the discriminate analysis technique, Sansom found that characteristics such as the ACT score, age, and number of core courses repeated were statistically significant in determining which students would pass the National Certification Examination. Her model accurately classified 81.6 percent of the students. Sansom believed that information gathered after graduation, including the variables of core courses grade point average, ACT score, age and number of credits received at graduation, contributed significantly to the model. This model accurately classified 78.4 percent of the students. Sansom stated "that as the demand for health information technologists increases, it is vital that the health information technology programs produce competent graduates to fill these positions, and since it is critical that these students entering these programs actually graduate and successfully write the certification examinations, educators in the Health Information programs must be concerned with maximizing the selection and retention of students who will fulfill these expectations."

Morris (1982), indicated that "the prediction of future performance is certainly no simple matter." Morris stated that our educational history shows a rather pronounced trend away from qualitative to more quantitative evaluations, and from subjective to objective evaluations. Morris indicated that as an important part of this trend, scientifically developed, systematic standardized and carefully validated tests are emerging as our most reliable tools in improving our predictive effectiveness.

Hardesty (1980), indicated that there has been no shortage in the investigations of the relationship between certain characteristics and academic achievement in college. The

most reliable characteristics identified are high school achievement and aptitude test scores.

Bello (1977) discussed the issue of "open admission policy" versus "selective admissions." Bello acknowledged that this is a very controversial issue among educators. He listed four reasons for "selectivity:"

1. Economically infeasible to enroll students who are poor academic risks, since a higher attrition rate would occur when selective admissions criteria were not applied.
2. More qualified students would not be chosen simply because of lack of space.
3. Severe emotional trauma would occur to the students who fail in the program.
4. Non-selectivity can lead to an academic program that is diluted when educators gear their teaching and expectations to the lower academic level.

Bellow (1977) provided equal arguments against selectivity including moral, ethical and humanistic values.

Health Information Management Education

To continually endorse the profession under the guidance of the American Medical Association (AMA) and the Committee on Allied Health Education and Accreditation (CAHEA), the American Health Information Management Association maintains two levels of post secondary education (Huffman, 1990). First is a two-year post secondary Associate Degree in Health Information Technology; and second is the four-year baccalaureate degree in Health Information Management (Skurka, 1988).

Students, during their Health Information Technology programs, are instructed in the following essentials including principles of medical terminology, anatomy and physiology, the science of health information management and administration, biostatistics, medicolegal issues, computer data entry/ retrieval and technology, classification of diseases, quality assessment, risk management, tumor registry, optical disc utilization scanning, transcription, record retrieval/retention, and management fundamentals required to perform the technical jobs associated within the Health Information Management services (Skurka, 1988).

The Health Information Management baccalaureate degree students have advanced courses in microbiology, Health Care finance, medicolegal policies and procedures, health care administration, humanities, management strategies and supervision, computerized programming, planning, and design, quality assessment, risk management, budgetary planning, department marketing, hospital intra and interpersonal relations and in-service education techniques (Huffman, 1990). The responsibility for providing qualified entry-level professionals in both levels of management and technology falls into the hands of the Health Information program educators (Osborn, 1986).

Post Secondary Program Education Assessment

As early as 1986, during the national convention of the American Health Information Management Association (AHIMA) and the Assembly on Education (AOE), a question arose about assessing the quality of the education programs. The association was particularly interested in identifying the characteristics that would predict success for the college candidate entering the programs (Osborn, 1986). Studies were undertaken to identify these characteristics that would predict success (Slovensky, 1986). Unfortunately,

none has successfully identified the exact combination in either the Health Record Technicians or Health Information Management programs (Plevak, 1984). Jennifer Cofer, past president of the Association, states that due to the increasing demands on the profession, it is critical that the educational programs in Health Administration and Health Information Technology harvest competent graduates to fill the positions in the Health Information department. Assessment of the curriculum, syllabi, courses, performance objectives, programs, and abilities of the students is essential in identifying the appropriate information to teach and the basic information that must be mastered at an entry-level competency (Slovensky, 1986).

The Health Information Management Association (AHIMA) and its Council on Certification (COC) and Assembly on Education (AOE) are familiar with the term "assessment." Assessment is, and has been, an intricate part of the association's essentials since the findings within the Flexner Report.

Quality Assessment begins with the identification of the environment in which an individual lives, learns and works (Graham, 1990). It attempts to determine the psychological pressures the environment creates and then proceeds to draw on that information about the individuals who are placed in that environment. It investigates such attributes as the individual's relevant strengths, weaknesses, needs, personality characteristics, skills and abilities (Wiggins, 1991).

The entry-level competencies developed by the Health Information Management (HIM) professional and the tools for assessing these competencies are in a continual state of revision as a consequence of the changes occurring in healthcare reform today. These characteristics are the tools that the association uses to evaluate and assess the quality of

the graduates. Just recently, the House of Delegates gave the practitioners and educators a mandate to assess and identify the exact characteristics that an individual should possess to be successful as a Health Information professional. Surveys, interviews, educational research, grants, dissertations and questionnaires have been used to identify these characteristics. Unfortunately, no single combination of specific characteristics has emerged as the formula that measures success.

In 1989-90, the American Health Information Management Association published the results of a research project, funded by the association, that identified the basic entry-level competencies graduates should possess after one year of employment. These entry-level competencies, according to the American Health Information Management Association, were to become the benchmark for the new guidelines, now referred to as the Domains, Tasks, and Subtasks (DTS) or entry level competencies, within the profession. These guidelines were to assist the educators in evaluating student outcomes (Sansom, 1993). once these domains, tasks and subtasks were endorsed by the AHIMA, the Council on Certification mandated they be incorporated into the curriculum of both the technology and administrative program to assess the students. The educators were instructed to identify, within their Health Information core courses, the performance objectives that identified the teaching of these domains, tasks and subtasks (AHIMA, 1991). These basic quality assessment tools were to establish the baseline for the curriculum, which was competency-based. This mandate from the Council on Certification forced the educational institutions to assess their curriculum and question whether tomorrow's professionals were being prepared adequately at the entry-level and whether the student's abilities met the standards necessary to compete in the changing health care environment during the 21st

century (Osborn, 1986).

The selection of the entry-level competencies are requirements for the curriculum (AHIMA, 1991). The collecting, analyzing, interpreting, and use of these entry-level competencies and the Domain's, Tasks and Subtasks, to increase student's critical thinking, problem solving, and quality assessment skills, is the responsibility of the educators within each college (AHIMA, 1991). Unfortunately, the issue in question is which cognitive characteristic, measurement or test is most appropriate to measure these entry-level competencies and what characteristics must each student possess to learn and use these competencies, and be successful during the college curriculum years, on the national certification examination and in the entry-level positions of the health information service departments (Slovensky, 1986).

According to Gupta (1991), the attrition data collected by CAHEA during 1989 and 1990 indicated that programs in Health Information Technology experienced an attrition rate of 17.4 percent. This attrition rate was so high and costly, in terms of time and money spent by both students and faculty, it seemed advantageous for Health Information Educators to invest time in identifying characteristics that more appropriately predict student success or failure, based on readily available assessment information (Sansom, 1993). This assessment information regarding the probability of success for each student would be extremely helpful at the time the student enters the program, during the student's progression, and in identifying which student would be at risk for failing the national certification/registration examination (Sansom, 1993).

In the field of education, according to Heath (1988), the division of the Allied Health Science core curricula have been plagued by accreditation impediments. Steven

Dowd (1991) says:

> "The current emphasis in education is on accountability. The challenge is to evaluate access and retention as well as other educationally relevant goals to define 'quality' or 'accountability.' In higher education, accountability should be proven through assessment and should consist of proof that what one says students receive from the educational experience is what they really get. The demands for accountability will lead to new ways to prove quality. The concept of value-added education will become more important and will be increasingly used as a measure of quality."
>
> Shugars (1991) and the PEW Health Professions

Commission indicated that the changes in health care education competencies for practitioners should be prepared by the year 2005. PEW stresses that the major strategies for change in health professional education will be that:

1. schools will redefine their education core;
2. schools will restructure for this task;
3. universities will have to foster innovations;
4. professional organizations will redefine the roles of their organizations; and
5. the public will participate in redefining health care and the role of the professional.

The approach began with the redefining of the curriculum within the American Health Information Management Association with the inception of the Domains, Tasks, and Subtasks. Steven Dowd (1993) indicated that redefining of the curriculum is important, but first, one must attempt to define the term "curriculum." The term is not easy to define precisely, although it does imply the necessity of a master plan that outlines institutional philosophy, goals, course descriptions, competency-based evaluations, performance objectives, policies and procedures, and an outcome assessment process. Curriculum development is very complicated, very loose and should take a middle of the

ground in the development of a curriculum and communicate the essence of the program. The courses and components of the curriculum should include a philosophy, rationale, learning outcome statements (competencies), learning activities, assessment of competency attainment and specifics of the learning environment.

Baker College's Health Information Technology/ Administrative programs were developed within this schema. The program solicited curriculum suggestions from various parts of the community, including employers, students, the AHIMA and practitioners as prescribed by John Marlowe (1983) who indicated that a multifaceted assessment process would allow the development of each student to be observed and improved upon as they move through the curriculum. A corresponding evaluation process allows the curriculum content to be validated at the same time against external and real-world standards. This method of assessing and validating the outcomes was patterned after the efforts of Marcia Mentkowski (1985) in her work on outcome assessment at Alverno Women's College. Denise Magner and Goldie Biumenstyk (1990) indicated that more and more college campuses are developing their own assessment tools rather than relying solely on standardized testing.

As denoted by Jon Boll (1988), in the analyzing of academic records, many of the ideas for the Health Information Technology/Management programs at Baker College came from the process of assessing the qualification of the students with input from various sources. The most important issues identified were that the recurrent and comprehensive analyses of the students' academic records would provide useful information for formulating policy decisions and developing assessment tools within the college.

A Physician Assistant Program at the University of Florida, under the direction of Wayne Bottom (1987), developed and implemented a computerized information management system patterned after and used to develop the database files for this study. The data files include admission scores, ASSET test scores, curriculum and evaluation reports, student academic records, and graduate and follow-up examination results. This technique, according to Wayne Bottom, would make the information readily accessible and the processing for the information, for the evaluation of students, retrospectively, concurrently and prospectively easy.

A suggestion by Brenda Jochums (1990) described the need for introducing problem solving techniques early in the curriculum with a team teaching approach, which the Health Information Technology and Administrative programs readily adopted.

Finally, the qualitative outcomes of the student should be completed with the development of a portfolio describing achievements completed by each student. This portfolio is a vehicle for monitoring student progress in achieving entrylevel competency. Mary Bunda, (1991), stressed that this vehicle not only supports student success but also remains a tool for the yearly reassessment of the students, and the Health Information Management/Technology program itself.

Conclusion

The intent of this literature search was to review preceding documentation that would assist in identifying variables, potentially workable, to support the development of the dissertation and to identify the things necessary for an individual to be successful in applying for, entrance into, completion of, and success on the National Health Information Certification Examination.

After extensive research, it is clear that no precise combinations of variables are as yet clearly defined. There is no precise formula that has proven entirely successful in identifying for educators the right attributes.

The search revealed twenty-two researchers who evaluated variables that would lead to identification of individuals who would be capable of qualifying for entrance into the Health Information Management Profession. None of these research studies successfully completed the task. There was a wide controversy regarding the exact blending of components, although three cognitive characteristics surfaced as potentials, and these seemed to be acceptable. These cognitive measures were high school grade point average (12), college graduate grade point average (18), and college placement scores, either ACT (8), or ASSET tests (13). The rest of the 17 characteristics were scattered throughout the research data base as important to one researcher but not mentioned in the publication of others.

The 22 characteristics were: Race (1), Age (4), Junior College (2), high school grade point average (12), college graduate grade point average (8), ASSET scores (12), ACT scores (13), personal interviews on entrance to college (2), admission testing (2), clinical affiliation performance (1), national certification examination scores (1), lapse of time from graduation of high school (1), open door policy of the college (3), 2.0-2.5 grade point average on admission to the professional core courses segment in the curriculum (2), standardized core courses (2), aptitude test (3), personal traits and interest (1), mock examinations prior to graduation from a college program (2), mature students versus adolescents (2), and core course grade point averages (5).

With the mandates and standards changing so rapidly, no agreement has yet surfaced

that identifies the specific variable combination. As these demands are progressively increasing, it is absolutely critical that identification of these variables be achieved. This was expanded throughout the literature search by researchers Slovensky, Eichenwald, Sansom, Osborn and Plevak. These variables should be measurable and obtainable. The curriculum in the universities associated with these variables must be competency-based and measurable within the essentials as defined by the Domains, Tasks, and Subtasks of the American Health Information Management Association.

As a final note, Slovensky, at the national Assembly of Education in July, 1994, emphasized that "one of the characteristics that has been under-utilized in this process and not addressed by other researchers except Tompkins and Harkins (1991), was the scores on the National Certification Examination in comparisons of the core courses in the college academic programs." This information may reveal with it results that a change in the curriculum, including the Domains, Tasks, and Subtasks of the national association, may be essential to assist in the success of the students, as mentioned by Shugars (1991) and the PEW commission. Further, the researcher wanted to address this issue since the national certification examination and the domains, tasks and subtasks were separated, as well as identified on the national certification examination.

Summary

The result of this literature research identified a number of variables, potentially workable, to support this dissertation. These variables included ASSET test scores, college science courses and core course grades, National Certification Examination scores, personal interests and personality factors, and graduation cumulative GPA'S.

The variables identified assisted in developing the data essential for the statistical

analysis. The literature research traced the development of the American Health Information Management Association that supports the competency-based curriculum and the literature research identified by the professionals who evaluated the need to continually update the curriculum and the professional image in order for the profession to move into the computer-based 21st Century.

The identification of the various variables and the literature research lead to the development of the dissertation and established a baseline for the formation of the hypotheses.

CHAPTER THREE

INTRODUCTION

The research evaluated specific variables, previously identified in the literature research, that may assist the college and faculty in identifying students competent to enter and:

1. achieve success in the post-secondary curriculum of Health Information Technology,
2. pass the American Health Information Management Association's National Certification Examinations, and
3. qualify for an entry-level position in a Health Care organization.

Design

The statistical approach was both a descriptive and analytical investigation evaluating the relationship between specifically identified dependent and independent variables. The design included a stepwise regression analysis.

This retrospective study analyzed the first-time takers' performance on the National Certification Examination from 1988 through 1993. Academic demographics and pre-admission variables for each candidate were included in the analysis. The National Certification Examination is administered once a year in October. Factors which were predictive of performance were identified through multiple regression analysis. The statistical package used was the Social Science (SPSS6.1).

If successful, the properly identified variables will assist the college admission departments and the Health Information faculty in establishing parameters for the selection of qualified candidates: 1) for admission to the programs, 2) the students at risk, and 3)

subsequently reduce the high attrition rate experienced by colleges throughout the United States within the Health Information programs.

The first step was to identify variables that measured the characteristics that one must possess on admission into the Health Information Technology programs. The variables, as previously identified in the literature research, were the ASSET test scores, the general science grades, the HIT course grade, and the cumulative graduation GPA. These results are compiled in Appendix B and C. Then a comparison was completed to determine whether there was a statistically significant correlation.

Population

The entire group of HIT 237 graduates were reviewed. These 237 graduates were enrolled in the Health Information Technology program from 1987 through 1993. The mean age of the 96.1 percent female dominant population was 32.5 years. Fifty percent of these students were part-time, carrying three or fewer courses per term.

All of the 237 students either completed the ASSET test and/or transferred ASSET test scores into the program from another university or college (See Appendix B, C). Each student successfully graduated from the program with an Associate Degree of Applied Science with a major in Health Information Technology. The mean grade point average upon graduation was 3.30 and all students were eligible to sit for the National Certification Health Information Technology Examination.

The National Certification Examination for HIT consists of 200 multiple choice questions. The questions are developed by educators and clinical practitioners and submitted to the Council on Certification. Members of the council review and approve each question. The questions are then placed in a National Certification Examination data

bank. The council, each year, approved the final draft for the National Certification Examination.

Since 1989, a candidate must obtain a minimum of 119 to 120 to pass the certification.

Independent Variables

The independent variables were:

1. ASSET scores including Reading, English, and Mathematics;
2. Grades of all general science courses;
3. Grades of all HIT core courses; and
4. Accumulative grade point averages on graduation.

Dependent Variables

The dependent variable was the National Certification Examination scores.

Extraneous Variables

Variables not measured, but which have influence on the outcome include personal problems, family responsibilities and job-related incidents that caused stress. These issues, as acknowledged by the researcher, are part of the student's makeup but are not part of the academic files and are not included in this research.

Hypotheses

The null hypotheses were:

H_1 There is no statistical significance between the ASSET scores on admission to the college and the passing of the National Certification Examination of AHIMA.

H_2 There is no statistical significance between a student's grades in the general college science course and the passing of the National Certification Examination of the AHIMA.

H_3 There is no statistical significance between a student's grades in the Health Information Technology core courses and the passing of the National Certification Examination of the AHIMA.

H_4 There is no statistical significance between the ASSET scores, the general science course grades, the Health Information core course grades, and the passing of the National Certification Examination of the AHIMA.

H_5 There is no statistical significance between a student's grade point average at graduation and the passing of the National Certification Examination of the AHIMA.

Apriori was determined that the null hypothesis would be rejected if the significance was less than or equal to P=.05.

Data Collection Procedure

All the data for this study was obtained by this researcher from student profiles located in the College Academic Department and the AHIMA. The researcher reviewed each profile. The results of the data collection profile are contained in Appendix B, C. Each student's grades were listed by course, as were the ASSET scores, the General Science courses, and the National Certification Examination. The GPA's at graduation were calculated by the school. Confidentiality of each student was maintained by coding the collection data profile.

Student files and the results on the National Certification Examination report were provided by the college and the American Health Information Management Association. The data source includes:

1. ASSET test scores, upon admission to the college;
2. Grades in all General Science courses;
3. Grades on HIT core courses;
4. Accumulative graduation grade point average at graduation; and

5. National Certification Examination results.

Approval for Data

Approval for data collection was secured from Baker College and the HIT students. The college and the HIT students understood that anonymity was being maintained. All data was given a numerical number with all records being maintained by the researcher. All of the information obtained from each student profile was coded and entered into a computer file in the SPSS6.1 program. Stepwise multiple regression was used to investigate the relationship of the ASSETS, General Science and HIT core course variables to the National Certification Examination score.

The first multiple regression analysis included the ASSET test scores (independent variables) to the National Certification Examination (dependent variables), the General Science course grades (independent) and the National Certification Examination (dependent); and the HIT core course grades (independent) and the National Certification Examination (dependent). Second, a combination of the eleven independent variables to the National Certification Examination dependent variables was completed. Finally, the cumulative GPA at graduation, as independent, and the National Certification Examinations, as dependent, was completed in a stepwise regression process.

Data Analysis Procedure

The research included a descriptive statistical and an inferential regression analysis to determine the relationships of the identified dependent to the independent variables.

The statistical computation was a stepwise multiple regression. The stepwise multiple regression process was a statistical tool used to determine correlations between

groups of variables. The amount of significances between the dependent variables and the independent variables was used to determine if the two groups of variables are related.

The Statistical Package for Social Sciences (SPSS) computer program was used for completion of the statistical analysis. The stepwise multiple regression process was performed in the following manner with one dependent variable correlation to a combination of independent variables. A stepwise entry process was used so that each variable was examined at each step for entry or removal.

The regression statistics used were the regression coefficient estimates, the descriptive and the model fit. The estimates display regression coefficients and related measures. For variables in the equation, statistics displayed are regression coefficient B, standard error of B, standardized coefficient beta, t value for B and one-tailed significance level of t. The descriptives are the variable means, standard deviation, and a correlation matrix with one-tailed probabilities. The model fit R, R2, Adjusted R2 and the standard error. Also, an ANOVA table displays degrees of freedom, (d.f) sums of squares and mean squares, F. value, the observed probability of F, and the model fit statistics.

A 95% confidence interval was selected for prediction intervals. The probability of F was P=.05, and the constant in the equation will be used and the excluded cases listwise will be deleted.

Data Review

The entire population was surveyed to secure the credibility of the research. If not, there may have been some questions that the remaining population was a credible representation. For example, if the dissertation used only 220 out of 237 graduates, the

question might arise as to why were the 17 graduates not used and where were the graduates who failed the National Certification Examination. This could cast doubt on the credibility of the dissertation. Second, it should be useful to remember that the population was intended to be representative of a larger whole; implying that what happened here was indicative of what is likely to happen generally among students, and then those who go on to attempt the Health Information Technology curriculum. The predictive power of the study then would be reliant because the population is representative of a larger population. Knowing that the actual scores of the students on the National Certification Examinations are available, these scores were the proper basis for correlation analysis.

Statistical Procedure

The statistical procedure included the evaluation of the significance between the independent and dependent variables via a stepwise multiple regression technique.

The data was displayed on a spreadsheet with the following information:

1. Graduates assigned a specific number to maintain anonymity.
2. ASSET test scores: separated by reading, writing, and mathematic scores;
3. Pass/fail on ASSET test scores;
4. All General Science core course grades;
5. Grades from:
    A. core courses, including:
        1. Management;
        2. Legal Aspects of Health Care;
        3. Personnel Administration;
        4. Health Information System;

5. Health Care Records;
6. Health Information Retrieval and Retention;
7. Health Care Statistics;
8. Quality Assessment;
9. Classification systems;
10. Coding including ICD-9-CM and CPT;
11. Medical Terminology;
12. Anatomy and Physiology;
13. Pathophysiology;

B. Accumulative GPA.

6. National Certification Examination scores. These results are compiled in Appendix B, C.

Summary

Once the investigation and analysis of the data was completed, a stepwise multiple regression was used to investigate the relationship between the independent and dependent variables.

CHAPTER FOUR

INTRODUCTION

This chapter presents the specific methodological procedure that investigates the significances of the independent to the dependent variables. As the organization of the study indicated, the previous chapters presented the purpose and scope, reviewed related literature, and researched methods used to sample, collect, and analyze the data.

In this chapter, the data was analyzed and the results are presented in four sections. The first section provides a description of the population. The second is a restatement of the null hypotheses. The third is the data collection instrument, and the final section is the stepwise multiple regression analysis, and its results.

Purpose

The purpose of the study was to identify, investigate, and evaluate basic characteristics essential for a student to be successful in both the post-secondary college Health Information Technology program and on the National Certification Examination leading to certification as a ART within the Health Information Management profession.

Site Population

The population make-up consisted of 237 students who graduated from a Health Information Technology program at a private, not-for-profit, four-year college from 1988 through 1993. All students selected completed the two-year Health Information Technology curriculum, graduated, and sat for the National Certification Examination for Accredited Record Technician certification.

The average age for this dominantly female (96.1%) profession was 32.5 years. Fifty percent of the students were part-time with a class load of three or fewer courses

per term.

All students, prior to admission to the college, were required to complete an ASSET placement test. The ASSET test scores within this study were completed at the participating college only. The student population who had ASSET scores from other universities were not included in this research because of the non-availability of the grading scales. one hundred and seventy-nine students or 75.5 percent of the entire population completed their ASSET scores at the participating college. one hundred and twenty-one students or 68 percent of the ASSET test population needed to complete developmental courses prior to entering the Health Information core curriculum. The developmental courses included Reading, Writing, Math and study skills. Twenty-two percent or 27 students needed all the developmental courses, 18.0 percent or 22 students needed study skills only, 0.8 percent or 1 student needed Reading only, 0.8 percent or 1 student needed Writing only with no student needing just Math.

The participating college's policy through 1991 was to recommend the completion of theses developmental courses, but not a requirement. In 1991 the college mandated every student with low scores on ASSET tests were to complete the developmental courses prior to entering the regular college curriculum. of the 122 students needing developmental courses, 21 percent or 26 students signed off or refused to take the courses and of the 26 refusals, 6 of those students failed the National Certification Examination, retrospectively. Additionally, of the 122 students needing developmental courses, 76% successfully completed the Health Information National Certification Examination.

The entire group of 237 students graduated from the Health Information Technology program with an Associate Degree of Applied Science. At the time of

graduation the mean grade point was 3.3. All 237 students were eligible for the National Certification Examination. These results are contained in Table 1.

TABLE I

DESCRIPTIVE STATISTICS

FOR

GRADUATE GRADE POINT AVERAGES

Mean	3.340	Std err	.024	Median	3.370
Mode	3.370	Minimum	2.280	Maximum	4.000

Valid cases 237 Missing cases 0

The independent variables (X) for this research consisted of: 1) ASSET test scores; 2) grades from the general science core (Medical Terminology I & II, Anatomy/ physiology I & II, and Pathophysiology) curriculum; 3) core course grades including Introduction to Health Information, Health Information Statistics, Health Information Application, Disease Classification, Coding I and II, Quality Assessment, and Administrative Medicolegal Principles/Practices; and 4) the cumulative grade point average at graduation.

Statistical Format

The data was retrieved from both the students' academic files at the participating college and the AHIMA's National Certification Examination scores from 1988 through 1993. Retrieved from the college were the ASSET test scores, the grades from the general science course, the grades from the core (HIT) curriculum, and the cumulative

Subsequently, the data was loaded into the SPSS 6.1 data analysis program. Both the student's and the variables were identified by a number.

Missing variable scores were left blank. Grades were identified within a numerical scale from 0.00 to 4.00. The ASSET test scores were identified numerically and by a pass/ fail sequence, 1 was pass and 0 was fail.

The National Certification Examination scores were identified by: 1) a pass/fail sequence (1 pass, 0 fail); and 2) test scores entered into the statistical program with a range from a zero (0) to 200. Descriptive statistics were:

1. Means, median, modes, minimum and maximum values were completed. These results are compiled in Tables 2, 3, 4 and 5.
2. Dependent variable (Y) identified as the scores from the National Certification Examination.
3. Independent variables (x):
    a) ASSET test scores;
    b) General science course grades;
    c) Health Information Technology core course grades;
    d) Cumulative grade point averages at graduation.
4. Regression analysis: r, R square, Adjusted R square, standard error, analysis of variance, degrees of freedom, sum of squares, means of squares, F, Significance of F, T, Significance of T, and Beta of the hypotheses.
5. A 95% confidence interval level;
6. Histograms;
7. Scatterplots with means, slopes and intercept lines.

The results from this analysis will be discussed on subsequent pages.

Data Analysis

The program Statistical Package for the Social Sciences (SPSS 6.1) was used to evaluate the means, frequency tables, cross-tabulation, correlation matrix, and the regression analysis.

The stepwise regression analysis was used to estimate the significance between the variables. The regression process was selected because first, it indicates the net effects of each variable in a regression equation, that is, the comparative impact of an independent variable on a dependent variable with all other independent variables controlled. Second, it provided an assessment of the overall influence of the independent variables on the dependent variable, that is, the R, or the amount of variance in the dependent variable explained by all the independent variables working together. Third, it was used to test the direction of the influence of the independent variables on the dependent variables and it identified which variables in the regression equation ($Y = A + BX$) are statistically significant using the F-ratio. The level of significance for this study was P=.05.

The data was rational and continuous. which is acceptable in the multiple regression analysis. The objectives were:

1. to measure the degree and direction of influence the independent variables had on the dependent variable.
2. to obtain an equation to predict an unknown value of the dependent variable, based on the known value of the independent variable.
3. to identify one variable as independent and one as dependent, both being derived from interval or ratio scales.

TABLE 2

DESCRIPTIVE STATISTICS

FOR
ASSET TEST SCORES

ASSETM ASSET MATH SCORE

Mean	30.015	Std err	.830	Median	31.000
Mode	21.000	Minimum	8.000	Maximum	53.000

Valid cases 197 Missing cases 40

ASSETR ASSET READING SCORE

Mean	35.274	Std err	.776	Median	37.000
Mode	44.000	Minimum	11.000	Maximum	53.000

Valid cases 197 Missing cases 40

ASSETW ASSET WRITING SCORE

Mean	43.193	Std err	.565	Median	45.000
Mode	47.000	Minimum	14.000	Maximum	59.000

Valid cases 197 Missing cases 40

TABLE 3

DESCRIPTIVE STATISTICS

FOR

GENERAL SCIENCE COURSES

APPP ANATOMY & PHYSIOLOGY I AND II; PATHOPHYSIOLOGY

Mean	3.301	Std err	.035	Median	3.330
Mode	4.000	Minimum	1.700	Maximum	4.000

Valid cases 237 Missing cases 0

MT MEDICAL TERMINOLOGY I & II

Mean	3.469	Std err	.038	Median	3.650
Mode	4.000	Minimum	1.150	Maximum	4.000

Valid cases 237 Missing cases 0

TABLE 4
DESCRIPTIVE STATISTICS
FOR
HEALTH INFORMATION CORE COURSES

HIM INTRODUCTION TO HEALTH INFORMATION MANAGEMENT

Mean	3.357	Std err	.036	Median	3.300
Mode	4.000	Minimum	1.700	Maximum	4.000

Valid cases 237 Missing cases 0

HIS INTRODUCTION TO HEALTH STATISTICS

Mean	3.250	Std err	.043	Median	3.300
Mode	4.000	Minimum	1.300	Maximum	4.000

Valid cases 237 Missing cases 0

HIAM INTRO TO HEALTH INFORMATION APPLICATION & MANAGEMENT

Mean	3.476	Std err	.036	Median	3.700
Mode	4.000	Minimum	1.700	Maximum	4.000

Valid cases 237 Missing cases 0

CODES INTRODUCTION TO DISEASE CLASSIFICATION CODING I AND II

Mean	3.082	Std err	.036	Median	3.150
Mode	2.850	Minimum	1.650	Maximum	4.000

Valid cases 237 Missing cases 0

QA INTRODUCTION TO QUALITY ASSESSMENT

Mean	3.424	Std err	.037	Median	3.700
Mode	4.000	Minimum	1.700	Maximum	4.000

Valid cases 237 Missing cases 0

ALPP INTRO TO ADMINISTRATIVE/LEGAL PRINCIPLES AND PRACTICES

Mean	3.258	Std err	.032	Median	3.300
Mode	3.000	Minimum	1.700	Maximum	4.000

Valid cases 237 Missing cases 0

TABLE 5

DESCRIPTIVE STATISTICS

FOR

NATIONAL CERTIFICATION EXAMINATION SCORE

Mean	135.698	Std err	1.438	Median	137.000
Mode	125.000	Minimum	87.000	Maximum	182.000

Valid cases 172 Missing cases 65

4. to determine the strength of the influence the independent had on the dependent variable indicated by R-square, ranging from zero (no influence) to one (perfect determination).
5. to indicate the direction and amount of influence, or slope of the regression line, the regression equation consisting of a constant or a regression coefficient.
6. to show that if the regression coefficient is positive, the significance is direct and the slope is upward to the right; if the regression coefficient is negative, the significance is inverse and the slope is downward to the right.
7. that the regression analysis required the significance be linear rather than curved or kinked.
8. that the regression also required the variance of the dependent variable around the regression line to be approximately equal from one end of the line to the other.
9. that both linearity and homogeneity of variance around the regression line can be checked by visual inspection of a scatterplot or by statistical tests during analysis A correlation matrix was also completed on the data to identify the variables that were most positive.

Hypotheses

Phase two of this study sought to determine to what degree the dependent variable of the National Certification Examination Scores and the independent variables was statistically significant.

The independent variables identified were, specifically, the ASSET Scores, the general science course grades, the Health Information Technology core course grades, and the

cumulative grade point averages upon graduation.

The above statements were rephrased into five null hypotheses as follows:

H_1 There is no statistical significance between the ASSET scores on admission to the college and the passing of the National Certification Examination of AHIMA.

H_2 There is no statistically significance between a student's grades in the general college science course and the passing of the National Certification Examination of the AHIMA.

H_3 There is no statistical significance between a student's grades in the Health Information Technology core courses and the passing of the National Certification Examination of the AHIMA.

H_4 There is no statistical significance between the ASSET scores, the general science course grades, the Health Information core course grades, and the passing of the National Certification Examination of the AHIMA.

H_5 There is no statistical significance between a student's grade point average at graduation and the passing of the National Certification Examination of the AHIMA.

ANALYSIS OF DATA

TESTING OF THE HYPOTHESIS

In the third phase of chapter IV, each of the five hypotheses were tested. The format was a statement of each hypothesis, followed by a determination as to the rejection or acceptance of same, with a description of the analysis techniques, and the results.

The first hypothesis focused specifically upon the significance between the ASSET test scores and the passing of National Certification Examination of the American Health Information Management Association. The hypothesis is stated in the NULL for testing.

Hypotheses

H_1 There is no statistical significance between the ASSET test scores and the passing of the National Certification Examination of the AHIMA.

The ASSET test scores were subdivided into three categories:

Category I, WRITING; Category II, READING; Category III, MATH. A score below 119 was the benchmark to require a student to take the developmental study skill courses prior to entering the college curriculum.

Hypothesis I was rejected showing that there was a statistical significance between the ASSET Test Scores in categories I, II, III and the passing of the National Certification Examination of the AHIMA.

HYPOTHESIS H_1 CATEGORY DATA ANALYSIS

SUMMARY OF STEPWISE REGRESSION ANALYSIS

DEPENDENT VARIABLE: National Certification Examination Scores

INDEPENDENT VARIABLE: ASSET TEST SCORES, CUMULATIVE

A stepwise regression analysis was completed on each of the categories with the (Y) axis as the dependent variable (the National Certification Examination Results) and the three categories (each done separately) as the independent variables (Table 6).

During the stepwise regression analysis process, the following data analysis was performed on each of the categories listed. A one-tail significance correlation, Multiple r, R squared, Adjusted R squared, Standard Error, F, Significance of F, 95 percent confidence level, B, Standard Error of B, Beta, T and Significance of T.

A Histogram and scatterplot with a mean, intercept and R2 were completed on each Asset Category to further support the regression analysis. Figure 1, 2, 3, 4, 5 and 6.

The cumulative report yielded an R2 of .19 indicating that 19% of the variability in the National Certification Examination could be explained by the cumulative ASSET Test Scores.

The statistical level P=.00001 (F = 33.62 with DF = 1). It was determined apriori that for the hypothesis to be rejected the significance of F would have to be less than or equal to P=.05, which it was; therefore, the null hypothesis was rejected. These results are contained in Table 7.

The second hypothesis focused specifically upon the significance between the grades in the general science courses and the passing of the National Certification Examination of AHIMA. The hypothesis is stated for the NULL for testing.

H_2 There is no statistical significance between a student's grades in the general science courses and the passing of the National Certification Examination of AHIMA.

The students' cumulative grades were divided into two Categories: Category I, Anatomy/Physiology I & II with Pathophysiology, and Category II, Medical Terminology I & II.

Hypothesis H2 was rejected showing that there was a statistically significance between the general science courses of Anatomy/Physiology I & II with Pathophysiology, Medical Terminology I & II, and the National Certification Examination scores.

HYPOTHESIS H2 CATEGORY DATA ANALYSIS

SUMMARY OF STEPWISE REGRESSION ANALYSIS

TABLE 9

DEPENDENT VARIABLES: National Certification Examination Scores

INDEPENDENT VARIABLES: Anatomy/Physiology with Pathophysiology and Medical Terminology I and II

A stepwise regression analysis was completed on each category with the (Y) axis being

TABLE 6

MULTIPLE REGRESSION TABLES
for
ASSET TEST SCORES

ASSET MATH

	Mean	Std Dev	Label
NATSCO	134.231	18.781	NATIONALS SCORE
ASSETM	31.769	11.837	ASSET MATH SCORE

Number of Cases = 143 Correlation, 1-tailed Sig:

	NATSCO	ASSETM
NATSCO	1.000	.195
	.	.010
ASSETM	.195	1.000
	.010	.

Equation Number 1 Dependent Variable: NATSCO NATIONALS SCORE

Block Number 1. Method: Stepwise Criteria PIN .0500 POUT .1000

Variable(s) Entered on Step Number

1.. ASSETM ASSET MATH SCORE

Multiple R	.19465	R Square	.03789
Adjusted R Square	.03107	Standard Error	18.48704

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	1	1897.74156	1897.74156
Residual	141	48189.64306	341.77052

F = 5.55268 Signif F = .0198

---------- Variables in the Equation ----------

Variable	B	SE B	95%	B	Beta
ASSETM	.308846	.131066	.049737	.567955	.194650
(Constant)	124.418961	4.441607	115.638208	133.199713	

------ in -----------

Variable	T	Sig T
ASSETM	2.356	.0198
(Constant)	28.012	.0000

TABLE 6 (CONTINUED)

ASSET READING

	Mean	Std Dev	Label
NATSCO	134.231	18.781	NATIONAL SCORES
ASSETR	36.294	18.929	ASSET READING SCORE

N of Cases = 143 Correlation, 1 tailed Sig:

	NATSCO	ASSETR
NATSCO	1.000	.277
	.	.000
ASSETR	.277	1.000
	.000	.

Equation Number 1 Dependent Variable NATSCO NATIONALS SCORE

Block Number 1.Method: Stepwise Criteria PIN .0500 POUT.1000

Variable(s) Entered on Step Number
1. ASSETR ASSET READING SCORE

Multiple R	.27712	R Square	.07680
Adjusted R Square	.07025	Standard Error	18.10938

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	1	3846.49161	3846.49161
Residual	141	46240.89301	327.94960

F = 11.72891 Signif F = .0008

---------- Variables in the Equation ----------

Variable	B	SE B	95%	B	Beta
ASSETR	.476268	.139049	.201318	.751101	.277120
(Constant)	116.947357	5.268940	106.531023	127.363691	

---------- in ----------

Variable	T	Sig T
ASSETR	3.425	.0008
(Constant)	22.196	.0000

TABLE 6 (CONTINUED)

ASSET WRITING

	Mean	Std Dev	Label
NATSCO	134.231	18.781	NATIONAL SCORES
ASSETW	42.762	7.927	ASSET WRITING SCORE

N of Cases = 143 Correlation, 1-tailed Sig:

	NATSCO	ASSETW
NATSCO	1.000	.439
	.	.000
ASSETW	.439	1.000
	.000	.

Equation Number 1 Dependent Variable NATSCO NATIONALS SCORE

Variable(s) Entered on Step Number

1. ASSETW ASSET WRITING SCORE

Multiple R	.43879	R Square	.19254
Adjusted R Square	.18681	Standard Error	16.93619

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	1	9643.73418	9643.73418
Residual	141	40443.65043	286.83440

F = 33.62126 Signif F = .0000

---------- Variables in the Equation ----------

Variable	B	SE B	95% CI B		Beta
ASSETW	1.039549	.179282	.685120	1.393978	.438792
(Constant)	89.777337	7.796241	74.364703	105.189971	

---------- in ----------

Variable	T	Sig T
ASSETW	5.798	.0000
(Constant)	11.515	.0000

Total Cases = 237

the dependent variable (the National Certification Examination Scores) and the (X) axis being the independent variables of Category I: Anatomy/Physiology I & II and Pathophysiology, and Category II being Medical Terminology I & II (Table 8).

During the stepwise regression analysis process, the following data analysis was performed on each of the categories listed: a one-tail significance correlation, Multiple r, R squared, Adjusted R squared, Standard Error, F, Significance of F, 95 percent confidence level, B, Standard Error of B, Beta, T and Significance of T.

A Histogram and a Scatterplot with a mean and intercept were completed to further support the regression analysis (Figures 7, 8, 9 and 10).

The report yielded an R2 of .179 indicating that 18% percent of the variability in the National Certification Examination could be explained by the Anatomy/Physiology I & II with Pathophysiology and Medical Terminology I & II course grades.
The statistical level was P=.00001 (F = 37.13 with DF = 1). It was determined apriori that in order for the hypothesis to be rejected the significance of F would have had to be less than or equal to P=.05, which it was; therefore, the null hypothesis was rejected. These results are contained in Table 9.

The third hypothesis focused specifically upon the significance between the grades in the Health Information core courses grades and the passing of the National Certification of AHIMA. The hypothesis is stated in the NULL for testing.

H_3 There is no statistical significance between a student's grades in the Health Information Technology core curriculum and the passing of the National Certification Examination of the AHIMA.

The students' grades from the HIT core courses were subdivided into six categories: Category I, Introduction to Health Information; Category II, Health Information Statistics;

TABLE 7

STEPWISE MULTIPLE R E G R E S S I O N ANALYSIS

	Mean	Std Dev	Label
NATSCO	134.231	18.781	NATIONALS SCORE
ASSETM	31.769	11.837	ASSET MATH SCORE
ASSETR	36.294	10.929	ASSET READING SCORE
ASSETW	42.762	7.927	ASSET WRITING SCORE

N of Cases = 143 Correlation, 1-tailed Sig:

	NATSCO	ASSETM	ASSETR	ASSETW
NATSCO	1.000	.195	.277	.439
	.	.010	.000	.000
ASSETM	.195	1.000	.850	.239
	.010	.	.000	.002
ASSETR	.277	.850	1.000	.407
	.000	.000	.	.000
ASSETW	.439	.239	.407	1.000
	.000	.002	.000	.

Equation Number 1 Dependent Variable NATSCO NATIONALS SCORE

Block Number 1. Method: Stepwise Criteria PIN .0500 POUT.1000

Variable(s) Entered on Step Number

1. ASSETW ASSET WRITING SCORE

Multiple R	.43879	R Square	.19254
Adjusted R Square	.18681	Standard Error	16.93619

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	1	9643.73418	9643.73418
Residual	141	40443.65043	286.83440

F = 33.62126 Signif F = .0000

---------- Variables in the Equation ----------

Variable	B	SE B	95%	B	Beta
ASSETW	1.039549	.179282	.685120	1.393978	.438792
(Constant)	89.777337	7.796241	74.364703	105.189971	

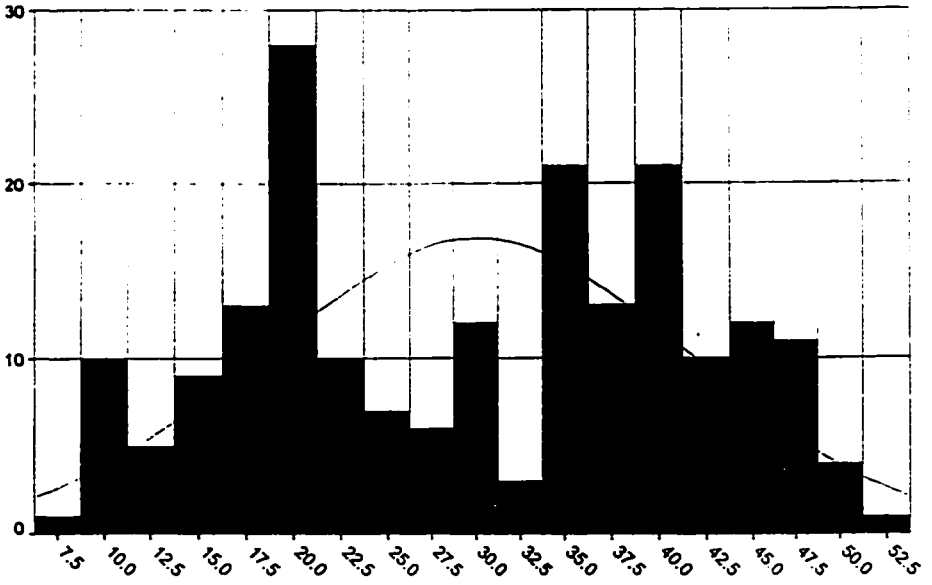
---------- in ----------

Variable	T	Sig T
ASSETW	5.798	.0000
(Constant)	11.515	.0000

---------- Variables not in the Equation ----------

Variable	Beta In	Partial	Min Toler	T	Sig T
ASSETM	.095262	.102944	.942930	1.225	.2228
ASSETR	.118172	.120135	.834506	1.432	.1544

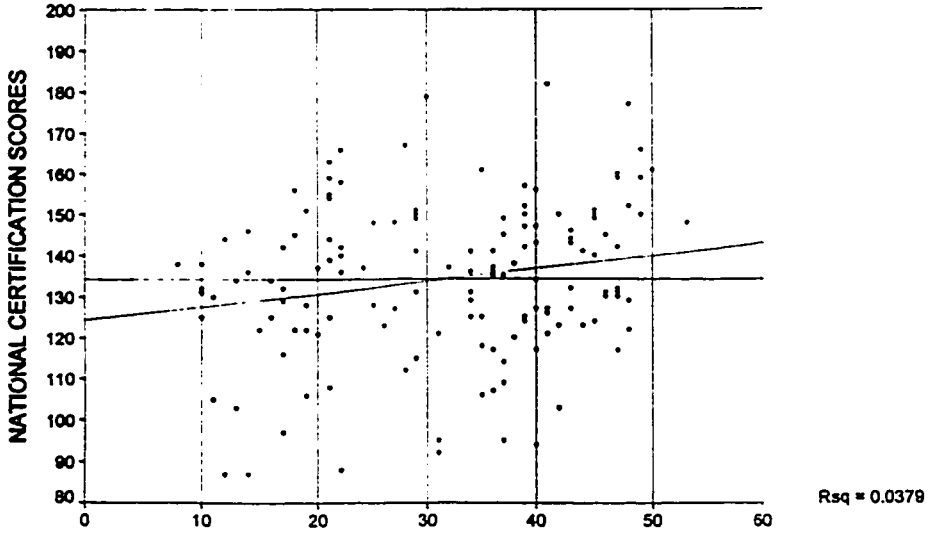
FIGURE I



HISTOGRAM FOR ASSET MATH TEST SCORES

MEAN FOR ASSET MATH TEST 31.769

FIGURE 2

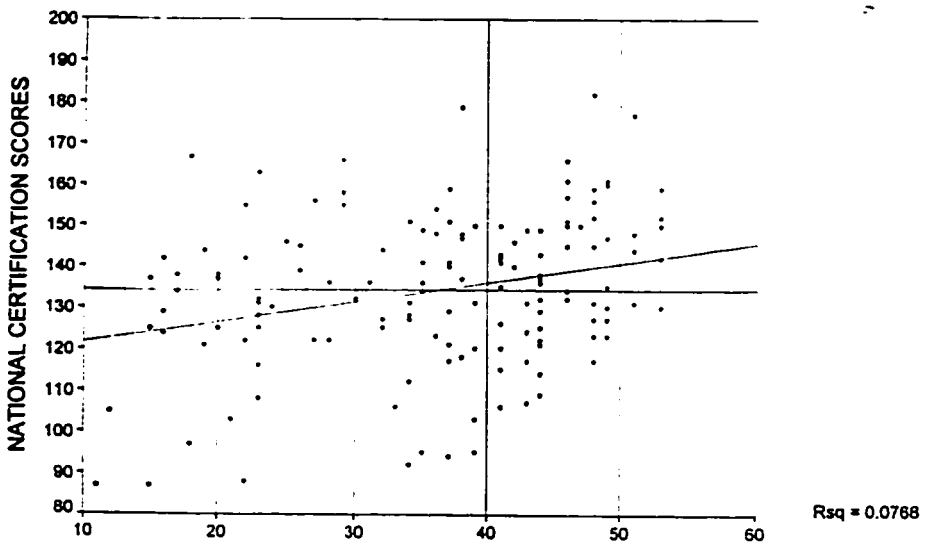


SCATTERPLOT FOR THE ASSET MATH TEST SCORES

MEAN FOR NATIONAL CERTIFICATION SCORES 134.231

MEAN FOR THE ASSET MATH TEST SCORES 31.769

FIGURE 3

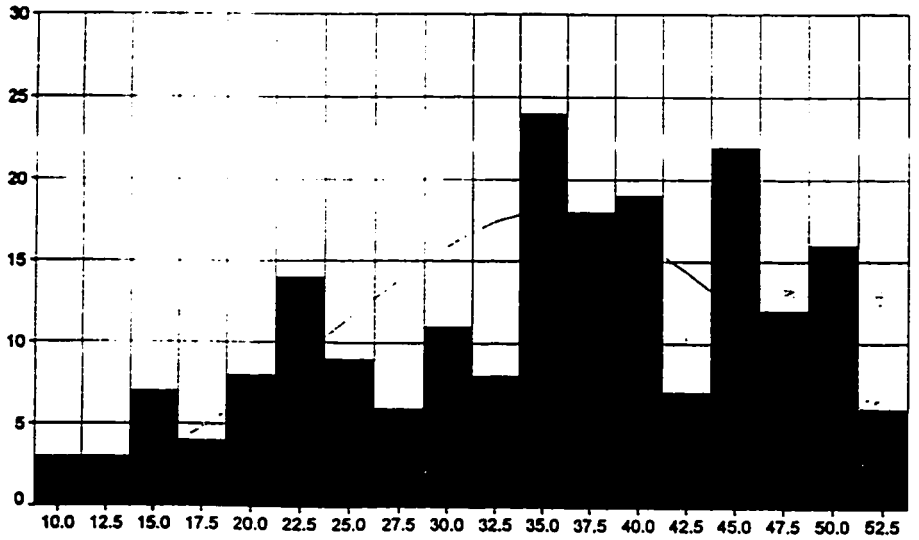


SCATTERPLOT FOR THE ASSET READING TEST SCORES

MEAN FOR NATIONAL CERTIFICATION SCORES 134.231

MEANT FOR THE ASSET READING TEST SCORES 36.294

FIGURE 4

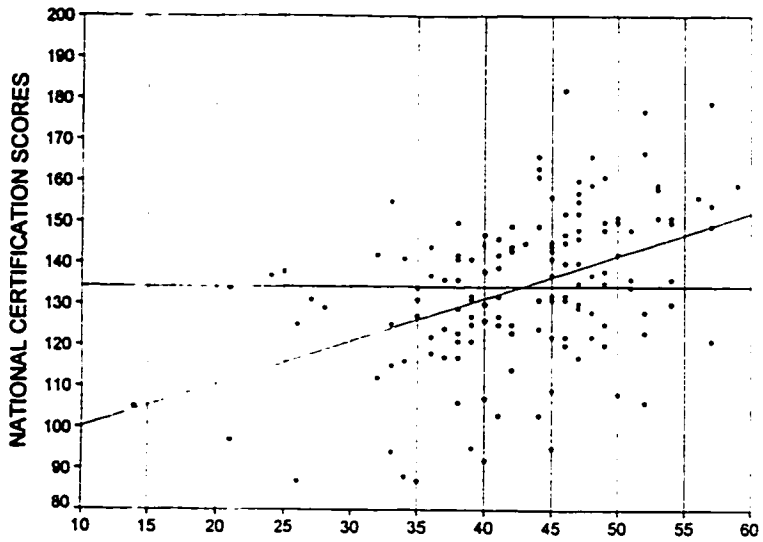


HISTOGRAM FOR ASSET READING SCORES

MEAN FOR NATIONAL CERTIFICATION SCORES 134.231

MEAN FOR THE ASSET READING TEST SCORES 36.294

FIGURE 5

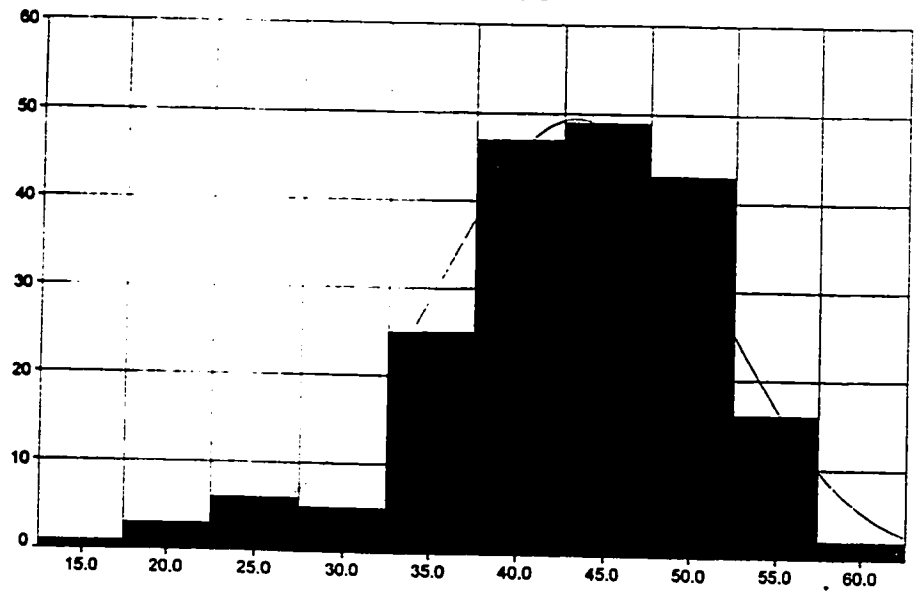


SCATTERPLOT FOR ASSET WRITING TEST SCORES

MEAN FOR NATIONAL CERTIFICATION TEST 134.231

MEAN FOR ASSET WRITING SCORES 42.762

FIGURE 6



HISTOGRAM FOR ASSET WRITING TEST SCORES

MEAN FOR ASSET WRITING TEST SCORES 42.762

Category III; Health Information Application; Category IV, Disease Classification Coding I & II; Category V, Quality Assessment; and Category VI, Administrative Medicolegal Principles and Practices. These results are contained in Table 10.

Hypothesis H3 was rejected showing that there was a statistically significant relationship between the Health Information Technology Core Courses and the National Certification Examination Scores from the American Health Information Management Association.

HYPOTHESIS H3 CATEGORY DATA ANALYSIS

SUMMARY OF STEPWISE REGRESSION ANALYSIS

DEPENDENT VARIABLES: National Certification Examination Scores

INDEPENDENT VARIABLES:

Category I:	Introduction to Health Information;
Category II:	Health Information Statistics;
Category III:	Health Information Application;
Category IV:	Disease Classification Coding I and II;
Category V:	Quality Assessment; and
Category VI:	Administrative Medicolegal Principles/ Practices.

A multiple stepwise regression analysis was completed on each category with the (Y) axis representative of the dependent variable (the National Certification Examination scores) and the (X) axis being the independent variables of the six categories.

Within the multiple (Table 11) stepwise regression, the following analysis was performed on each of the categories listed. As were as in combination, a one-tail

TABLE 8

MULTIPLE REGRESSION

FOR

GENERAL SCIENCE COURSES

MEDICAL TERMINOLOGY I & II

	Mean	Std Dev	Label
NATSCO	135.698	18.862	NATIONAL SCORES
MT	3.441	.613	MEDICAL TERMINOLOGY

N of Cases = 172 Correlation, 1-tailed Sig:

	NATSCO	MT
NATSCO	1.000	.360
	.	.000
MT	.360	1.000
	.000	.

Equation Dependent Variable NATSCO NATIONALS SCORE

Variable(s) Entered on Step Number
1. MT MEDICAL TERMINOLOGY

Multiple R	.35969	R Square	.12938
Adjusted R Square	.12426	Standard Error	17.65109

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	1	7870.88419	7870.88419
Residual	170	52965.39488	311.56115

F = 25.26273 Signif F = .0000

---------- Variables in the Equation ----------

Variable	B	SE B	95% CI		Beta
MT	11.067771	2.202014	6.720959	15.41458	.364692
(Constant)	97.611028	7.696212	82.418578	112.803478	

---------- in ----------

Variable	T	Sig T
MT	5.026	.0000
(Constant)	12.683	.0000

Total Cases = 237

ANATOMY & PHYSIOLOGY I & II WITH PATHOPHYSIOLOGY

	Mean	Std Dev	Label
NATSCO	135.698	18.862	NATIONALS SCORE
APPP	3.295	.542	A & P I AND II; PATHO

N of Cases = 172

Correlation, 1-tailed Sig:

	NATSCO	APPP
NATSCO	1.000	.423
	.	.000
APPP	.423	1.000
	.000	.

Equation Number 1 Dependent Variable NATSCO NATIONALS SCORE

Variable(s) Entered on Step Number

1. APPP A & P I AND II; PATHO

Multiple R	.42337	R Square	.17924
Adjusted R Square	.17442	Standard Error	17.13816

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	1	10904.48056	10904.48056
Residual	170	49931.79851	293.71646

F = 37.12587 Signif F = .0000

---------- Variables in the Equation ----------

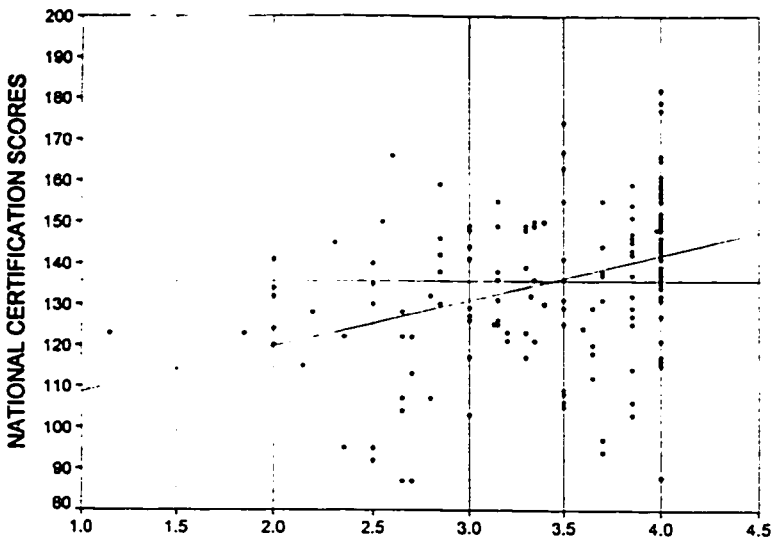
Variable	B	SE B	95% CI		Beta
APPP	14.737875	2.418781	9.963161	19.512589	.423371
(Constant)	87.131834	8.077040	71.187623	103.076046	

---------- in ----------

Variable	T	Sig T
APPP	6.093	.0000
(Constant)	10.788	.0000

Total Cases = 237

FIGURE 7

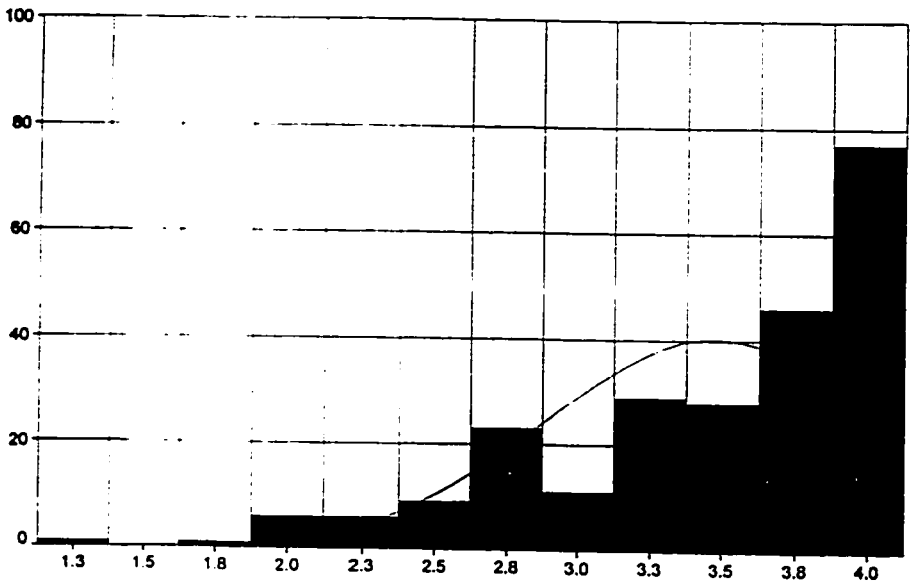


SCATTERPLOT FOR MEDICAL TERMINOLOGY I & II

NATIONAL CERTIFICATION TEST SCORES MEAN 135.698

MEAN FOR MEDICAL TERMINOLOGY I & II 3.441

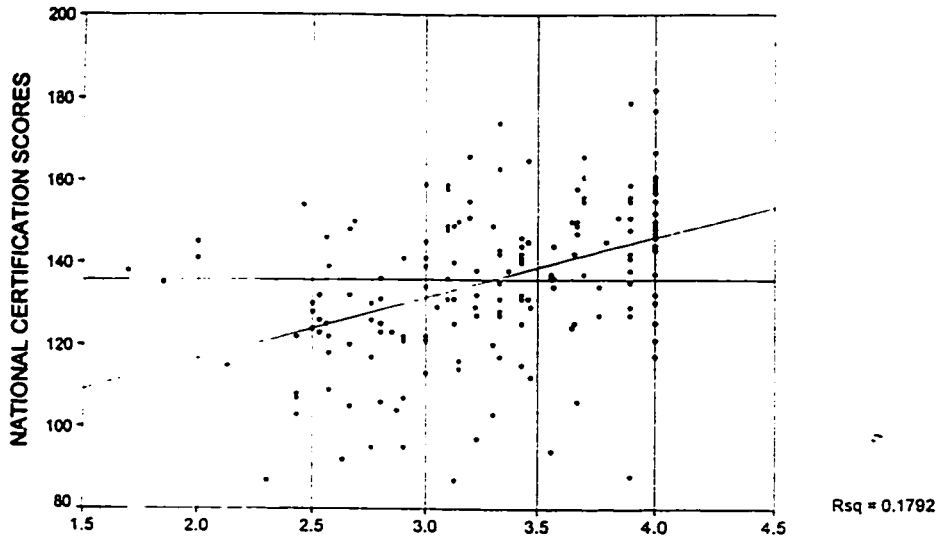
FIGURE 8



HISTOGRAM FOR MEDICAL TERMINOLOGY I & II

MEAN FOR MEDICAL TERMINOLOGY I & II 3.441

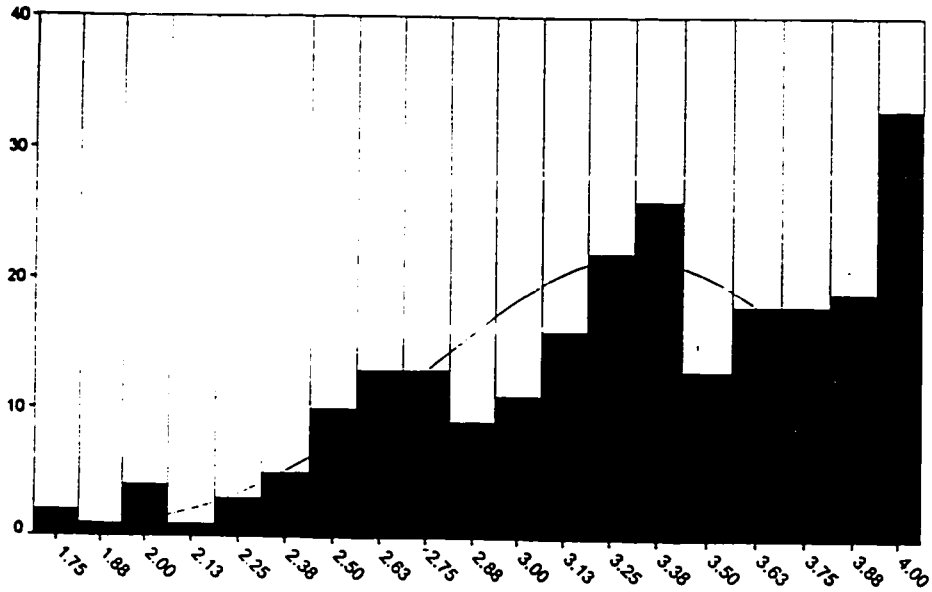
FIGURE 9



SCATTERPLOT ANATOMY/PHYSIOLOGY I & II WITH PATHOPHYSIOLOGY

MEAN NATIONAL CERTIFICATION SCORES 135.698

FIGURE 10



HISTOGRAM FOR ANATOMY/PHYSIOLOGY I & II WITH PATHOPHYSIOLOGY

MEAN FOR ANATOMY/ PHYSIOLOGY I & II WITH PATHOPHYSIOLOGY 3.295

TABLE 9
STEPWISE MULTIPLE REGRESSION ANALYSIS

	Mean	Std Dev	Label
NATSCO	135.698	18.862	NATIONALS SCORE
APPP	3.295	.542	A & P I AND II; PATHO
MT	3.441	.613	MEDICAL TERMINOLOGY

N of Cases = 172 Correlation, 1-tailed Sig:

	NATSCO	APPP	MT
NATSCO	1.000	.423	.360
	.	.000	.000
APPP	.423	1.000	.645
	.000	.	.000
MT	.360	.645	1.000
	.000	.000	.

Equation Number 1 Dependent Variable NATSCO NATIONALS SCORE

Variable(s) Entered on Step Number

1. APPP A & P I AND II; PATHO

Multiple R	.42337	R Square	.17924
Adjusted R Square	.17442	Standard Error	17.13816

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	1	10904.48056	10904.48056
Residual	170	49931.79851	293.71646

F = 37.12587 Signif F = .0000

---------- Variables in the Equation ----------

Variable	B	SE B	95% CI		Beta
APPP	14.737878	2.418781	9.963161	19.512589	.423371
(Constant)	87.131834	8.077040	71.187623	103.076046	

---------- in ----------

Variable	T	Sig T
APPP	6.093	.0000
(Constant)	10.788	.0000

---------- Variables not in the Equation ----------

Variable	Beta In	Partial	Min Toler	T	Sig T
MT	.148514	.125339	.584592	1.642	.1024

Total Cases = 237

TABLE 10

MULTIPLE REGRESSION
HEALTH INFORMATION CORE COURSES

INTRODUCTION TO HEALTH INFORMATION MANAGEMENT

	Mean	Std Dev	Label
NATSCO	135.698	18.862	NATIONAL SCORES
HIM	3.309	.555	INTRODUCTION TO HIM

N of Cases = 172 Correlation, 1-tailed Sig:

	NATSCO	HIM
NATSCO	1.000	.392
	.	.000
HIM	.392	1.000
	.000	.

Equation Number 1 Dependent Variable NATSCO NATIONALS SCORE

Variable(s) Entered on Step Number
1. HIM INTRODUCTION TO HIM

Multiple R	.39237	R Square	.15395
Adjusted R Square	.14898	Standard Error	17.40018

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	1	9365.99394	9365.99394
Residual	170	51470.28513	302.76638

F = 30.93472 Signif F = .0000

---------- Variables in the Equation ----------

Variable	B	SE B	95% CI	B	Beta
HIM	13.339958	2.398454	8.605370	18.074546	.392370
(Constant)	91.552495	8.047194	75.667199	107.437792	

---------- in ----------

Variable	T	Sig T
HIM	5.562	.0000
(Constant)	11.377	.0000

Total Cases = 237

TABLE 10 (CONTINUED)
INTRODUCTION TO HEALTH INFORMATION STATISTICS

	Mean	Std Dev	Label
NATSCO	135.698	18.862	NATIONAL SCORES
HIS	3.254	.670	HEALTH STATISTICS

N of Cases = 172 Correlation, 1-tailed Sig:

	NATSCO	HIS
NATSCO	1.000	.493
	.	.000
HIS	.493	1.000
	.000	.

Equation Number 1 Dependent Variable NATSCO NATIONALS SCORE

Variable(s) Entered on Step Number

1. HIS HEALTH STATISTICS

Multiple R	.49321	R Square	.24326
Adjusted R Square	.23881	Standard Error	16.45626

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	1	14798.84644	14798.84644
Residual	170	46037.43263	270.80843

F = 54.64692 Signif F = .0000

---------- Variables in the Equation ----------

Variable	B	SE B	95% CI	B	Beta
HIS	13.876444	1.877134	10.170949	17.581938	.493211
(Constant)	90.545179	6.235552	78.236094	102.854263	

---------- in ----------

Variable	T	Sig T
HIS	7.392	.0000
(Constant)	14.521	.0000

Equation Number 1 Dependent Variable NATSCO NATIONALS SCORE

Total Cases = 237

TABLE 10 (CONTINUED)
INTRODUCTION TO HEALTH INFORMATION APPLICATION AND MANAGEMENT

	Mean	Std Dev	Label
NATSCO	135.698	18.862	NATIONAL SCORES
HIAM	3.440	.562	HIM APPLICATION/MANAGEMENT

N of Cases = 172 Correlation, 1-tailed Sig:

	NATSCO	HIAM
NATSCO	1.000	.434
	.	.000
HIAM	.434	1.000
	.000	.

Equation Number 1 Dependent Variable NATSCO NATIONALS SCORE

Variable(s) Entered on Step Number

1. HIAM HIM APPLICATION/MANAGEMENT

Multiple R	.43426	R Square	.18858
Adjusted R Square	.18381	Standard Error	17.04040

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	1	11472.50255	11472.50255
Residual	170	49363.77652	290.37516

F = 39.50924 Signif F = .0000

--------- Variables in the Equation ----------

Variable	B	SE B	95% Ci	B	Beta
HIAM	14.586724	2.320643	10.005735	19.167713	.434258
(Constant)	85.518496	8.088194	69.552265	101.484726	

---------- in ----------

Variable	T	Sig T
HIAM	6.286	.0000
(Constant)	10.573	.0000

Equation Number 1 Dependent Variable NATSCO NATIONALS SCORE

Total Cases = 237

TABLE 10 (CONTINUED
DISEASE CODING CLASSIFICATIONS I & II

	Mean	Std Dev	Label
NATSCO	135.698	18.862	NATIONAL SCORES
CODES	3.063	.561	CODING I AND II

N of Cases = 172

Correlation, 1-tailed Sig:

	NATSCO	CODES
NATSCO	1.000	.514
	.	.000
CODES	.514	1.000
	.000	.

Equation Number 1 Dependent Variable NATSCO NATIONALS SCORE

Variable(s) Entered on Step Number

1. CODES CODING I AND II

Multiple R	.51387	R Square	.26406
Adjusted R Square	.25973	Standard Error	16.22845

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	1	16064.64414	16064.64414
Residual	170	44771.63493	263.36256

F = 60.99821 Signif F = .0000

---------- Variables in the Equation ----------

Variable	B	SE B	95% CI	B	Beta
CODES	17.264210	2.210488	12.900669	21.627750	.513871
(Constant)	82.816999	6.882920	69.230000	96.403998	

---------- in ----------

Variable	T	Sig T
CODES	7.810	.0000
(Constant)	12.032	.0000

Equation Number 1 Dependent Variable NATSCO NATIONALS SCORE

Total Cases = 237

TABLE 10 (CONTINUED)
QUALITY ASSESSMENT

	Mean	Std Dev	Label
NATSCO	135.698	18.862	NATIONAL SCORES
QA	3.381	.588	QUALITY ASSESSMENT

N of Cases = 172

Correlation, 1-tailed Sig:

	NATSCO	QA
NATSCO	1.000	.529
	.	.000
QA	.529	1.000
	.000	.

Equation Number 1 Dependent Variable NATSCO NATIONALS SCORE

Variable(s) Entered on Step Number

1. QA QUALITY ASSESSMENT

Multiple R	.52921	R Square	.28006
Adjusted R Square	.27582	Standard Error	16.05111

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	1	17037.78405	17037.78405
Residual	170	43798.49502	257.63821

F = 66.13066 Signif F = .0000

---------- Variables in the Equation ----------

Variable	B	SE B	95% CI	B	Beta
QA	16.979422	2.087957	12.857761	21.101084	.529207
(Constant)	78.298343	7.163708	64.157063	92.439622	

---------- in ----------

Variable	T	Sig T
QA	8.132	.0000
(Constant)	10.930	.0000

Equation Number 1 Dependent Variable NATSCO NATIONALS SCORE

Total Cases = 237

TABLE 10 (CONTINUED)
ADMINISTRATIVE AND LEGAL PRINCIPLES AND PRACTICES

	Mean	Std Dev	Label
NATSCO	135.698	18.862	NATIONAL SCORES
ALPP	3.264	.512	ADMIN/LEGAL PRIN/PRACTICES

N of Cases = 172

Correlation, 1-tailed Sig:

	NATSCO	ALPP
NATSCO	1.000	.368
	.	.000
ALPP	.368	1.000
	.000	.

Equation Number 1 Dependent Variable NATSCO NATIONALS SCORE

Variable(s) Entered on Step Number

1 ALPP ADMIN/LEGAL PRIN/PRACTICES

Multiple R	.36811	R Square	.13551
Adjusted R Square	.13042	Standard Error	17.58885

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	1	8243.79823	8243.79823
Residual	170	52592.48084	309.36753

F = 26.64726 Signif F = .0000

---------- Variables in the Equation ----------

Variable	B	SE B	95% CI	B	Beta
ALPP	13.567659	2.628322	8.379307	18.756012	.368114
(Constant)	91.415831	8.682468	74.276494	108.555169	

---------- in ----------

Variable	T	Sig T
ALPP	5.162	.0000
(Constant)	10.529	.0000

N of Cases = 172

significance correlation, R, R squared, Adjusted R squared, Standard Error, F, Significance of F, 95 percent confidence level, B, Standard Error of B, Beta, T and Significance of T.

A Histogram and a scatterplot with a mean and intercept were completed to further support the regression analysis (Figures 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, and 22).

The analysis in combination yielded an R2 of .3807 indicating that 38% of the variability in the National Certification Examination could be explained by the six Categories in combination with the Health Information Technology core courses. The statistical level of this relationship was P=.00001 (F = 34.43340 with DF = 3).

It was determined apriori that in order for the hypothesis to be rejected the significance of the F would have to be less or equal to P=.05, which it was; therefore, the null hypothesis was rejected. These results are contained in Table 11.

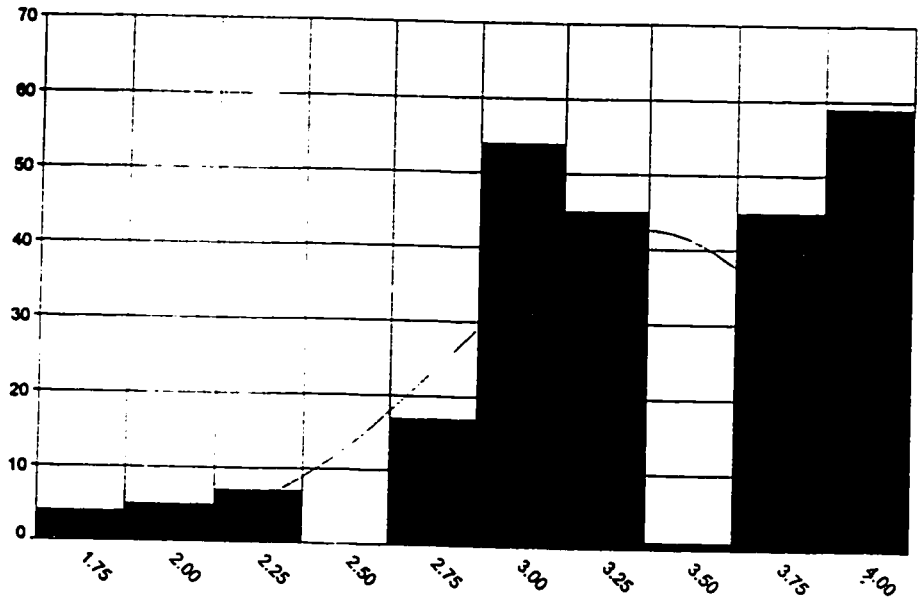
The fourth hypothesis focused specifically upon the significance between the grades of the ASSET scores, the general science courses, and the HIT core courses and the passing of the National Certification Examination. The hypothesis is stated in the NULL for testing.

H_4 There is no statistical significance between the ASSET scores ' the general science course grades, the Health Information core course grades in combination, and the passing of the National Certification Examination of the AHIMA.

The ASSET scores, the general science courses and the Health Information Technology core courses were combined to complete a multiple regression. Excluded from this analysis were the grade point averages at graduation.

Hypothesis 4 was rejected showing that there was a statistically significance among

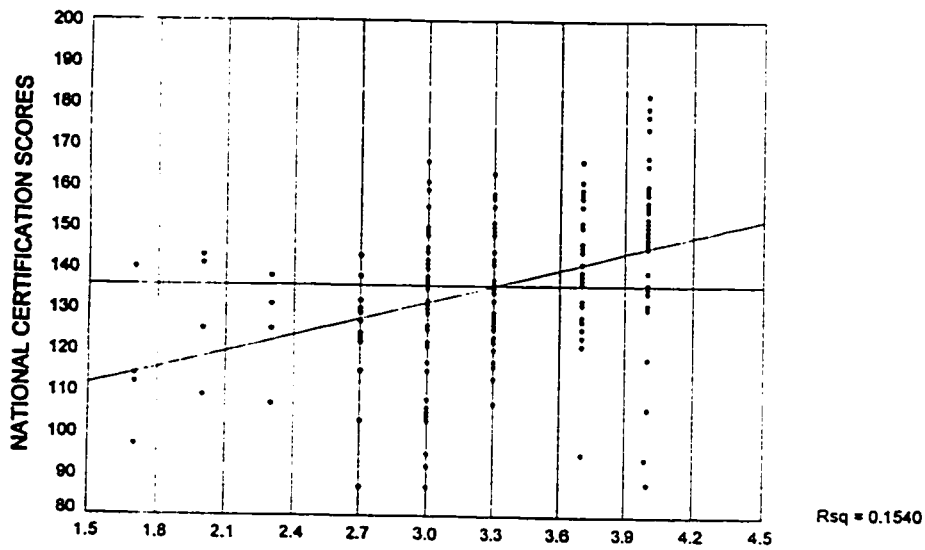
FIGURE 11



HISTOGRAM OF INTRODUCTION TO HEALTH INFORMATION MANAGEMENT

MEAN FOR HIM COURSE 3.309

FIGURE 12

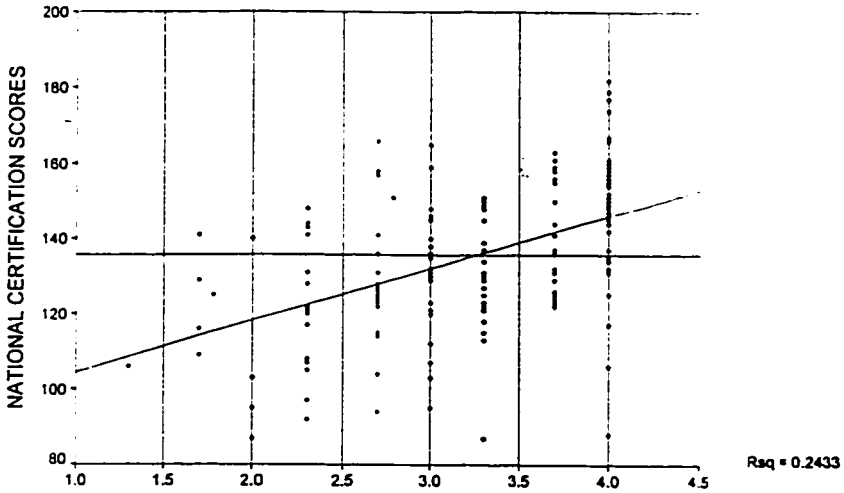


SCATTERPLOT FOR INTRODUCTION TO HEALTH INFORMATION MANAGEMENT

MEAN FOR NATIONAL CERTIFICATION SCORES 135.69

MEAN FOR THE HEALTH INFORMATION MANAGEMENT COURSE 3.309

FIGURE 13

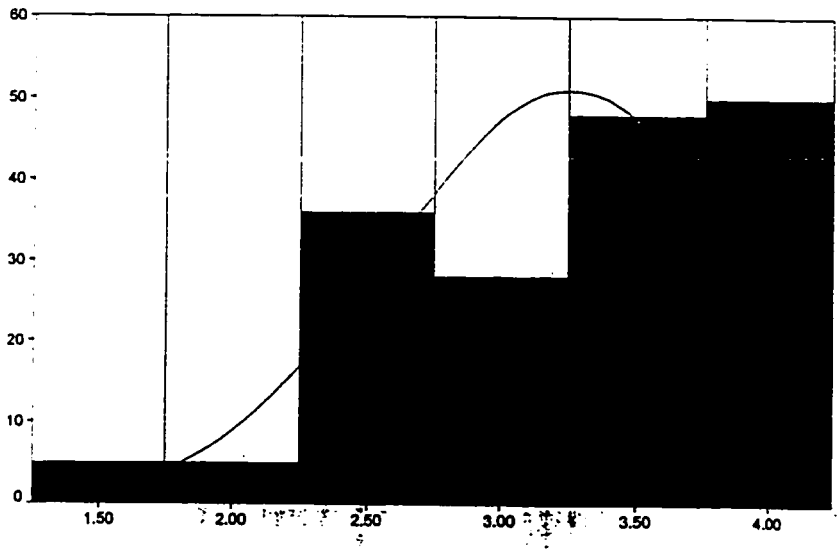


SCATTERPLOT FOR HEALTH INFORMATION STATISTICS

MEAN FOR NATIONAL CERTIFICATION SCORES 135.698

MEAN FOR HEALTH INFORMATION STATISTICS 3.309

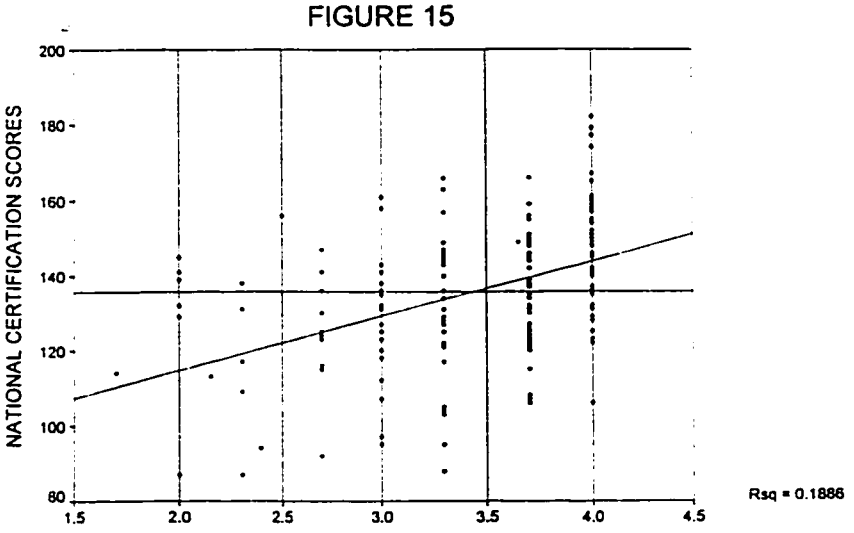
FIGURE 14



HISTOGRAM FOR HEALTH INFORMATION STATISTICS

MEAN FOR HEALTH INFORMATION STATISTICS 3.254

FIGURE 15

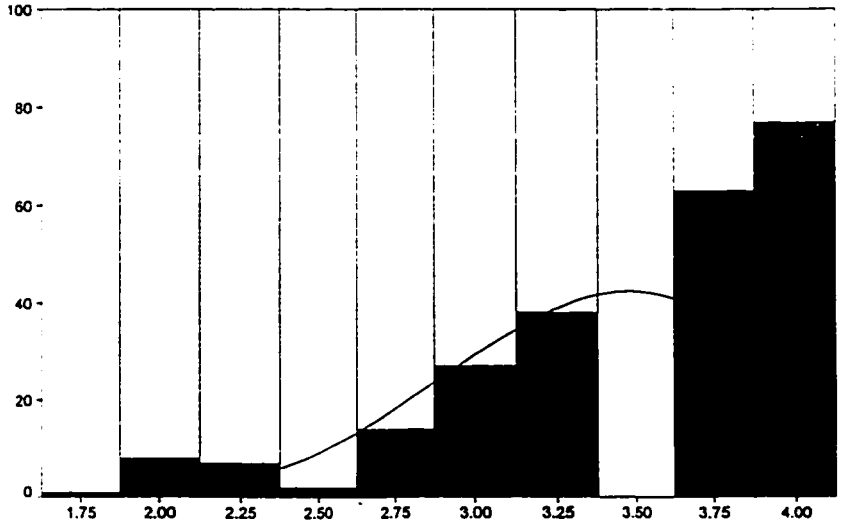


SCATTERPLOT FOR HEALTH INFORMATION APPLICATION & MANAGEMENT

MEAN NATIONAL CERTIFICATION SCORES 135.698

MEAN FOR HEALTH INFORMATION APPLICATION & MANAGEMENT 3.440

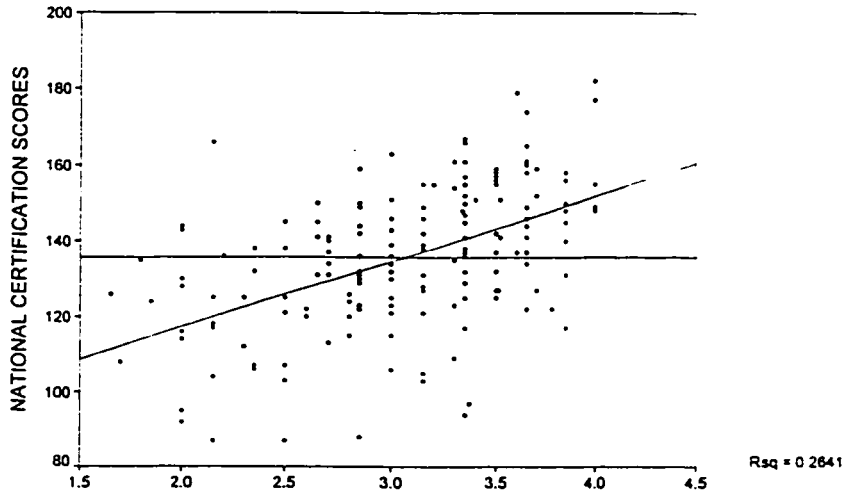
FIGURE 16



HISTOGRAM FOR HEALTH INFORMATION APPLICATION & MANAGEMENT

MEAN FOR HEALTH INFORMATION APPLICATION & MANAGEMENT 3.440

FIGURE 17

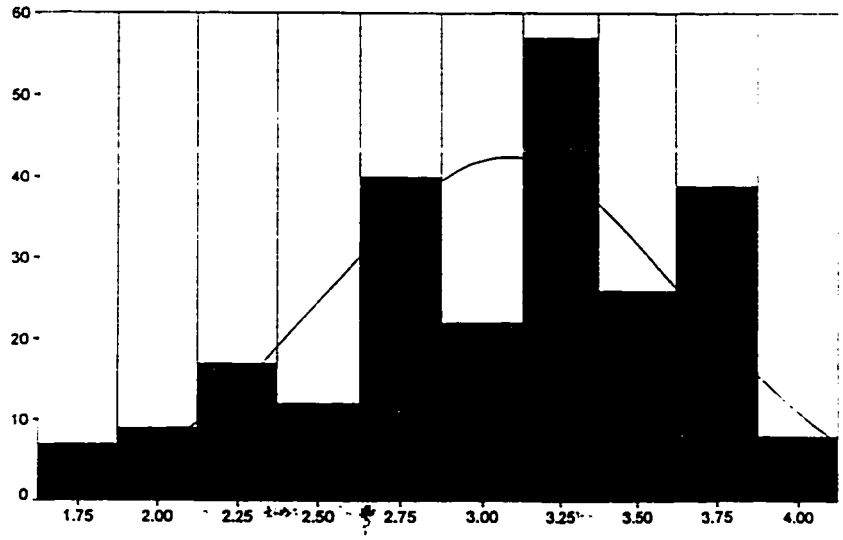


SCATTERPLOT FOR DISEASE CLASSIFICATION CODING I & II

MEAN NATIONAL CERTIFICATION SCORES 135.698

MEAN FOR DISEASE CLASSIFICATION CODING I & II 3.063

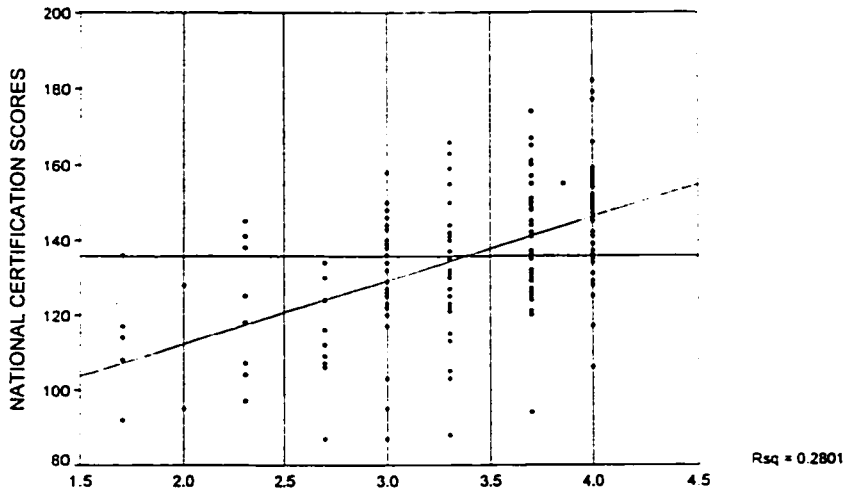
FIGURE 18



HISTOGRAM FOR DISEASE CLASSIFICATION CODING I & II

MEAN FOR DISEASE CLASSIFICATION CODING I & II 3.063

FIGURE 19

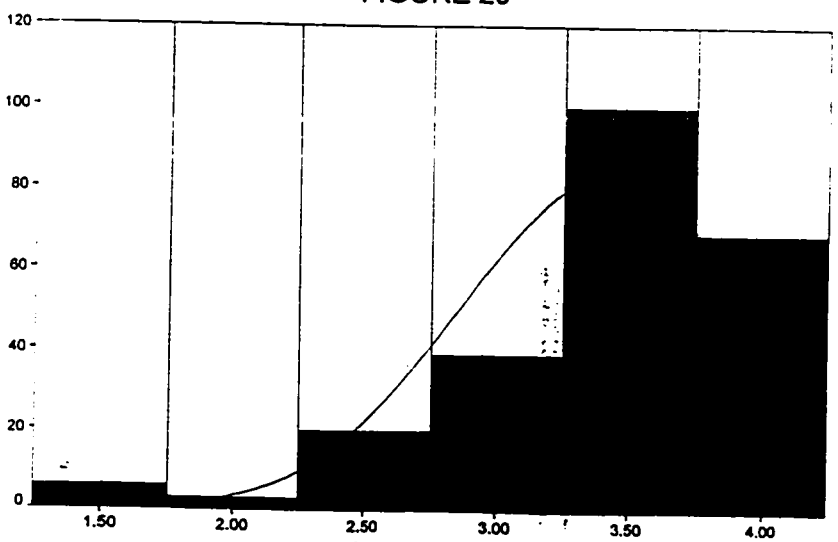


SCATTERPLOT FOR QUALITY ASSESSMENT

MEAN NATIONAL CERTIFICATION SCORES 135.698

MEAN FOR QUALITY ASSESSMENT 3.381

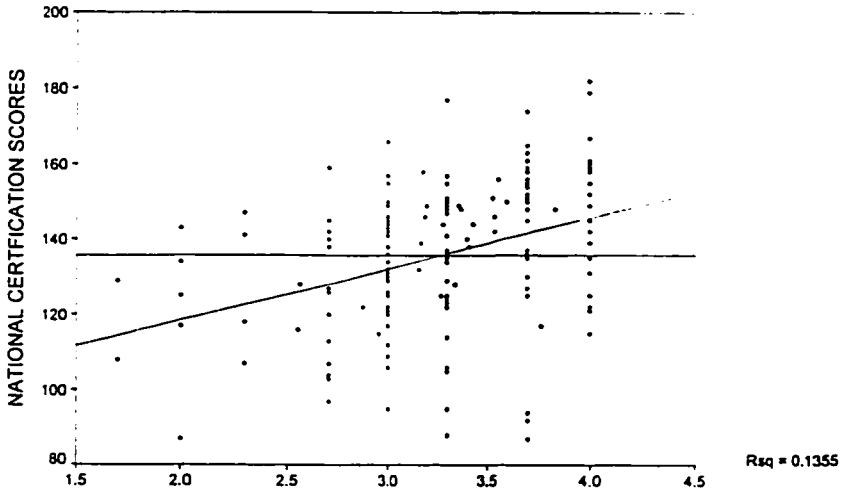
FIGURE 20



HISTOGRAM FOR QUALITY ASSESSMENT

MEAN FOR QUALITY ASSESSMENT 3.381

FIGURE 21

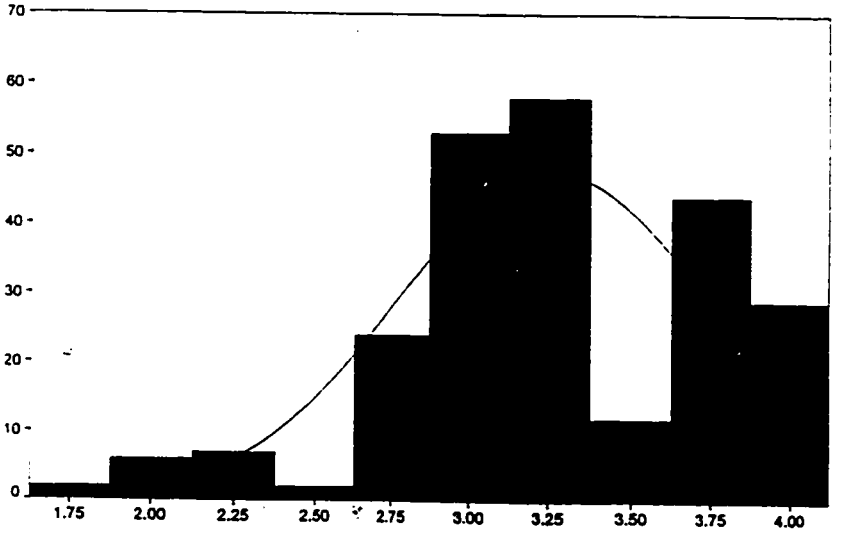


SCATTERPLOT ADMINISTRATIVE/LEGAL PRINCIPLES & PRACTICES

MEAN NATIONAL CERTIFICATION SCORES 135.698

MEAN FOR ADMINISTATIVE/LEGAL PRINCIPLES & PRACITICES 3.264

FIGURE 22



HISTOGRAM FOR ADMINISTRATIVE/LEGAL PRINCIPLES & PRACTICES

MEAN ADMINISTRATIVE/LEGAL PRINCIPLES & PRACTICES 3.264

the 11 independent variables and the National Certification Examination of the AHIMA.

HYPOTHESIS H_4 CATEGORY DATA ANALYSIS

SUMMARY OF STEPWISE REGRESSION ANALYSIS

DEPENDENT VARIABLE: National Certification Examination Scores

INDEPENDENT VARIABLE: 11 Independent Variables

The multiple stepwise regression was completed with the (Y) axis as the dependent variable (the National Certification Examination Results) and the ASSET test scores, the general science grades, and the Health Information Core Course grades as the independent variables.

Within the multiple stepwise regression, the following analysis was performed on the combination listed. A one-tail significance correlation, Multiple r, R squared, Adjusted R squared, Standard Error, F, Significance of F, 95 percent confidence level, B, Standard Error of B, Beta, T and Significance of T.

The report yielded an R2 of .43343 indicating that 43% of the variability in the National Certification Examination could be explained by the 11 independent variable scores.

The statistical level of this relationship was P=.00001 (F = 26.39 with DF = 4). It was determined apriori that in order for the hypothesis to be rejected the significance of F would have to be less than or equal to .05, which it was; therefore, the null hypothesis was rejected. The results are contained in Table 12.

The fifth hypothesis focused specifically upon the significance between the cumulative grade point average at graduation and the passing of the National Certification Examination. The hypothesis is stated in the NULL for testing.

TABLE 11

STEPWISE MULTIPLE REGRESSION ANALYSIS
HEALTH INFORMATION CORE COURSES
(EXCLUDING THE GPA'S)

	Mean	Std Dev	Label
NATSCO	135.698	18.862	NATIONAL SCORES
HIM	3.309	.555	INTRODUCTION TO HIM
HIS	3.254	.670	HEALTH STATISTICS
HIAM	3.440	.562	HIM APPLICATION/MANAGEMENT
CODES	3.063	.561	CODING I AND II
QA	3.381	.588	QUALITY ASSESSMENT
ALPP	3.264	.512	ADMIN/LEGAL PRIN/PRACTICES

N of Cases = 172 Correlation, 1-tailed Sig:

	NATSCO	HIM	HIS	HIAM	CODES	QA	ALPP
NATSCO	1.000	.392	.493	.434	.514	.529	.368
	.	.000	.000	.000	.000	.000	.000
HIM	.392	1.000	.428	.330	.312	.452	.276
	.000	.	.000	.000	.000	.000	.000
HIS	.493	.428	1.000	.348	.479	.496	.432
	.000	.000	.	.000	.000	.000	.000
HIAM	.434	.330	.348	1.000	.480	.467	.339
	.000	.000	.000	.	.000	.000	.000
CODES	.514	.312	.479	.480	1.000	.693	.515
	.000	.000	.000	.000	.	.000	.000
QA	.529	.452	.496	.467	.693	1.000	.461
	.000	.000	.000	.000	.000	.	.000
ALPP	.368	.276	.432	.339	.515	.461	1.000
	.000	.000	.000	.000	.000	.000	.

Equation Number 1 Dependent Variable NATSCO NATIONALS SCORE

Block Number 1. Method: Stepwise Criteria PIN .0500 POUT .1000

Variable(s) Entered on Step Number

1 QA QUALITY ASSESSMENT

Multiple R	.52921	R Square	.28006
Adjusted R Square	.27582	Standard Error	16.05111

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	1	17037.78405	17037.78405
Residual	170	43798.49502	257.63821

F = 66.13066 Signif F = .0000

TABLE 11 (CONTINUED)

Variables in the Equation					
Variable	B	SE B	95% CI	B	Beta
QA	16.979422	2.087957	12.857761	21.101084	.529207
(Constant)	78.298343	7.163708	64.157063	92.439622	

in		
Variable	T	Sig T
QA	8.132	.0000
(Constant)	10.930	.0000

Variables not in the Equation					
Variable	Beta In	Partial	Min Toler	T	Sig T
HIM	.192579	.202479	.795864	2.688	.0079
HIS	.306099	.313316	.754289	4.289	.0000
HIAM	.239173	.249203	.781587	3.345	.0010
CODES	.283199	.240770	.520377	3.225	.0015
ALPP	.157422	.164594	.787039	2.169	.0315

Equation Number 1 Dependent Variable NATSCO NATIONAL SCORES

Variable(s) Entered on Step Number
2. HIS HEALTH STATISTICS

Multiple R	.59223	R Square	.35073
Adjusted R Square	.34305	Standard Error	15.28795

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	2	21337.34854	10668.67427
Residual	169	39498.93053	233.72148

F = 45.64696 Signif F = .0000

Variables in the Equation					
Variable	B	SE B	95% CI	B	Beta
HIS	8.612070	2.007912	4.648251	12.575890	.306099
QA	12.111183	2.289796	7.590896	16.631470	.377476
(Constant)	66.732762	7.336621	52.249535	81.215990	

in		
Variable	T	Sig T
HIS	4.289	.0000
QA	5.289	.0000
(Constant)	9.096	.0000

TABLE 11 (CONTINUED)

---------- Variables not in the Equation ----------

Variable	Beta In	Partial	Min Toler	T	Sig T
HIM	.122655	.131012	.683940	1.713	.0886
HIAM	.198276	.215048	.655284	2.854	.0049
CODES	.213177	.186287	.485601	2.458	.0150
ALPP	.084106	.089308	.679157	1.162	.2468

Equation Number 1 Dependent Variable. NATSCO NATIONAL SCORES

Variable(s) Entered on Step Number
3. HIAM HIM APPLICATION/MANAGEMENT

Multiple R	.61706	R Square	.38076
Adjusted R Square	.36970	Standard Error	14.97464

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	3	23164.00517	7721.33506
Residual	168	37672.27390	224.23973

F = 34.43340 Signif F = .0000

-------- Variables in the Equation -------

Variable	B	SE B	95% CI	B	Beta
HIS	7.754338	1.989589	3.826521	11.682155	.275613
HIAM	6.660093	2.333502	2.053329	11.266857	.198276
QA	9.622957	2.406345	4.872387	14.373527	.299924
(Constant)	55.024133	8.274765	38.688215	71.360051	

---------- in ----------

Variable	T	Sig T
HIS	3.897	.0001
HIAM	2.854	.0049
QA	3.999	.0001
(Constant)	6.650	.0000

--------- Variables not in the Equation ------------

Variable	Beta In	Partial	Min Toler	T	Sig T
HIM	.100507	.109174	.614277	1.419	.1577
CODES	.167023	.145770	.469567	1.904	.0586
ALPP	.060158	.064915	.611504	.841	.4017

Total Cases = 237

TABLE 12

STEPWISE MULTIPLE REGRESSION ANALYSIS

TOTAL COURSE CURRICULUM

	Mean	Std Dev	Label
NATSCO	134.231	18.781	NATIONALS SCORE
ASSETM	31.769	11.837	ASSET MATH SCORE
ASSETR	36.294	10.929	ASSET READING SCORE
ASSETW	42.762	7.927	ASSET WRITING SCORE
MT	3.457	.626	MEDICAL TERMINOLOGY
APPP	3.305	.541	A & P I AND II; PATHO
HIM	3.291	.577	INTRODUCTION TO HIM
HIS	3.200	.682	HEALTH STATISTICS
HIAM	3.419	.551	HIM APPLICATION/MANAGEMENT
CODES	3.045	.568	CODING I AND II
QA	3.353	.599	QUALITY ASSESSMENT
ALPP	3.242	.515	ADMIN/LEGAL PRIN/PRACTICES

N of Cases = 143 CORRELATION 1-TAILED SIG.

	NATSCO	ASSETM	ASSETR	ASSETW	MT	APPP	HIM	HIS
NATSCO	1.000	.195	.277	.439	.348	.410	.378	.469
	.	.010	.000	.000	.000	.000	.000	.000
ASSETM	.195	1.000	.850	.239	.118	.217	.039	.284
	.010	.	.000	.002	.080	.005	.324	.000
ASSETR	.277	.850	1.000	.407	.169	.248	.108	.286
	.000	.000	.	.000	.022	.001	.100	.000
ASSETW	.439	.239	.407	1.000	.127	.156	.196	.160
	.000	.002	.000	.	.065	.032	.010	.028
MT	.348	.118	.169	.127	1.000	.609	.265	.372
	.000	.080	.022	.065	.	.000	.001	.000
APPP	.410	.217	.248	.156	.609	1.000	.287	.536
	.000	.005	.001	.032	.000	.	.000	.000
HIM	.378	.039	.108	.196	.265	.287	1.000	.419
	.000	.324	.100	.010	.001	.000	.	.000
HIS	.469	.284	.286	.160	.372	.536	.419	1.000
	.000	.000	.000	.028	.000	.000	.000	.
HIAM	.437	-.010	.058	.258	.234	.404	.369	.386
	.000	.452	.244	.001	.002	.000	.000	.000
CODES	.477	.187	.253	.153	.411	.525	.309	.494
	.000	.013	.001	.034	.000	.000	.000	.000
QA	.497	.194	.234	.225	.446	.572	.469	.505
	.000	.010	.002	.003	.000	.000	.000	.000
ALPP	.315	.069	.089	.124	.248	.338	.244	.426
	.000	.207	.146	.070	.001	.000	.002	.000

TABLE 12 (CONTINUED)

	HIAM	CODES	QA	ALPP
NATSCO	.437	.477	.497	.315
	.000	.000	.000	.000
ASSETM	-.010	.187	.194	.069
	.452	.013	.010	.207
ASSETR	.058	.253	.234	.089
	.244	.001	.002	.146
ASSETW	.258	.153	.225	.124
	.001	.034	.003	.070
MT	.234	.411	.446	.248
	.002	.000	.000	.001
APPP	.404	.525	.572	.338
	.000	.000	.000	.000
HIM	.369	.309	.469	.244
	.000	.000	.000	.002
HIS	.386	.494	.505	.426
	.000	.000	.000	.000
HIAM	1.000	.485	.469	.352
	.	.000	.000	.000
CODES	.485	1.000	.683	.497
	.000	.	.000	.000
QA	.469	.683	1.000	.425
	.000	.000	.	.000
ALPP	.352	.497	.425	1.000
	.000	.000	.000	.

Equation Number 1 Dependent Variable NATSCO NATIONAL SCORES

Variable(s) Entered on Step Number
1. QA QUALITY ASSESSMENT

Multiple R	.49717	R Square	.24718
Adjusted R Square	.24184	Standard Error	16.35309

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	1	12380.65016	12380.65016
Residual	141	37706.73445	267.42365

F = 46.29602 Signif F = .0000

---------- Variables in the Equation ----------

Variable	B	SE B	95% CI		Beta
QA	15.583247	2.290267	11.055546	20.110948	.497173
(Constant)	81.972404	7.801198	66.549971	97.394837	

---------- in ----------

Variable	T	Sig T
QA	6.804	.0000
(Constant)	10.508	.0000

Equation Number 1 Dependent Variable NATSCO NATIONAL SCORES

TABLE 12 (CONTINUED)

---------- Variables not in the Equation ----------

Variable	Beta In	Partial	Min Toler	T	Sig T
ASSETM	.101883	.115185	.962237	1.372	.1723
ASSETR	.170071	.190569	.945219	2.297	.0231
ASSETW	.344386	.386747	.949406	4.962	.0000
MT	.156915	.161832	.800736	1.940	.0543
APPP	.186583	.176385	.672780	2.120	.0357
HIM	.185561	.188922	.780342	2.276	.0243
HIS	.292684	.291066	.744515	3.600	.0004
HIAM	.261215	.265898	.780052	3.264	.0014
CODES	.257913	.217201	.533908	2.633	.0094
ALPP	.126196	.131648	.819276	1.571	.1184

Variable(s) Entered on Step Number
2. ASSETW ASSET WRITING SCORE

Multiple R	.59982	R Square	.35978
Adjusted R Square	.35064	Standard Error	15.13436

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	2	18020.55667	9010.27834
Residual	140	32066.82794	229.04877

F = 39.33782 Signif F = .0000

Equation Number 1 Dependent Variable NATSCO NATIONAL SCORES

---------- Variables in the Equation ----------

Variable	B	SE B	95% CI	B	Beta
ASSETW	.815891	.164422	.490820	1.140962	.344386
QA	13.155272	2.175325C	8.854537	17.456006	.419710
(Constant)	55.225285	9.009985	37.412060	73.038510	

---------- in ----------

Variable	T	Sig T
ASSETW	4.962	.0000
QA	6.047	.0000
(Constant)	6.129	.0000

---------- Variables not in the Equation ----------

Variable	Beta In	Partial	Min Toler	T	Sig T
ASSETM	.033420	.040109	.909815	.473	.6368
ASSETR	.047701	.053757	.813103	.635	.5267
MT	.145545	.162695	.771991	1.944	.0539
APPP	.172905	.177146	.653874	2.122	.0356
HIM	.147348	.161779	.761888	1.933	.0553
HIS	.271916	.292776	.723275	3.610	.0004
HIAM	.200165	.217448	.755549	2.627	.0096
CODES	.258255	.235840	.519051	2.861	.0049
ALPP	.114323	.129258	.789176	1.537	.1266

Equation Number 1 Dependent Variable NATSCO NATIONAL SCORES

TABLE 12 (CONTINUED)

Variable(s) Entered on Step Number
3. HIS HEALTH STATISTICS

Multiple R	.64394	R Square	.41466
Adjusted R Square	.40203	Standard Error	14.52314

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	3	20769.26287	6923.08762
Residual	139	29318.12174	210.92174

F = 32.82302 Signif F = .0000

--------- Variables in the Equation -----------

Variable	B	SE B	95% CI	B	Beta
ASSETW	.784195	.158026	.471750	1.096640	.331007
HIS	7.487118	2.074012	3.386428	11.587807	.271916
QA	8.941677	2.391636	4.212987	13.670367	.285278
(Constant)	46.753748	8.958920	29.040370	64.467126	

---------- in ------------

Variable	T	Sig T
ASSETW	4.962	.0000
HIS	3.610	.0004
QA	3.739	.0003
(Constant)	5.219	.0000

Equation Number 1 Dependent Variable NATSCO NATIONAL SCORES

---------- Variables not in the Equation ------------

Variable	Beta In	Partial	Min Toler	T	Sig T
ASSETM	-.019452	-.023853	.708509	-.280	.7797
ASSETR	-.002555	-.002955	.714547	-.035	.9724
MT	.099824	.114619	.651240	1.355	.1775
APPP	.083643	.084028	.590739	.991	.3236
HIM	.089730	.100158	.653149	1.183	.2390
HIAM	.154927	.172872	.649242	2.062	.0411
CODES	.193034	.179090	.485925	2.138	.0342
ALPP	.048167	.054856	.673430	.645	.5197

Variable(s) Entered on Step Number
4. CODES CODING I AND II

Multiple R	.65836	R Square	.43343
Adjusted R Square	.41701	Standard Error	14.34002

TABLE 12 (CONTINUED)

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	4	21709.58735	5427.39684
Residual	138	28377.79727	205.63621

F = 26.39320 Signif F = .0000

Equation Number 1 Dependent Variable NATSCO NATIONAL SCORES

---------- Variables in the Equation ----------

Variable	B	SE B	95% CI	B	Beta
ASSETW	.788980	.156049	.480423	1.097537	.333027
HIS	6.417132	2.108103	2.248772	10.585492	.233056
CODES	6.383533	2.985190	.480905	12.286160	.193034
QA	5.412423	2.881053	-.284293	11.109139	.172680
(Constant)	42.367443	9.080661	24.412219	60.322666	

---------- in ----------

Variable	T	Sig T
ASSETW	5.056	.0000
HIS	3.044	.0028
CODES	2.138	.0342
QA	1.879	.0624
(Constant)	4.666	.0000

---------- Variables not in the Equation ----------

Variable	Beta In	Partial	Min Toler	T	Sig T
ASSETM	-.023571	-.029369	.485904	-.344	.7314
ASSETR	-.018253	-.021347	.485770	-.250	.8030
MT	.081804	.094740	.466622	1.114	.2673
APPP	.057199	.057690	.450932	.676	.4999
HIM	.102613	.116079	.442480	1.368	.1736
HIAM	.125186	.138350	.474958	1.635	.1043
ALPP	.006780	.007565	.468113	.089	.9296

LIMITED REACHED

H_5 There is no statistical significance between a student's cumulative grade point average at graduation and the passing of the National Certification Examination of the AHIMA.

The cumulative grade point average at graduation was the independent variable.

Hypothesis H5 was rejected showing that there was a statistical significance between the cumulative graduation grade point average and the National Certification Examination Scores.

HYPOTHESIS H_5 CATEGORY DATA ANALYSIS

SUMMARY OF STEPWISE REGRESSION ANALYSIS

DEPENDENT VARIABLES: National Certification Examination Scores

INDEPENDENT VARIABLES: Graduate Grade Point Averages

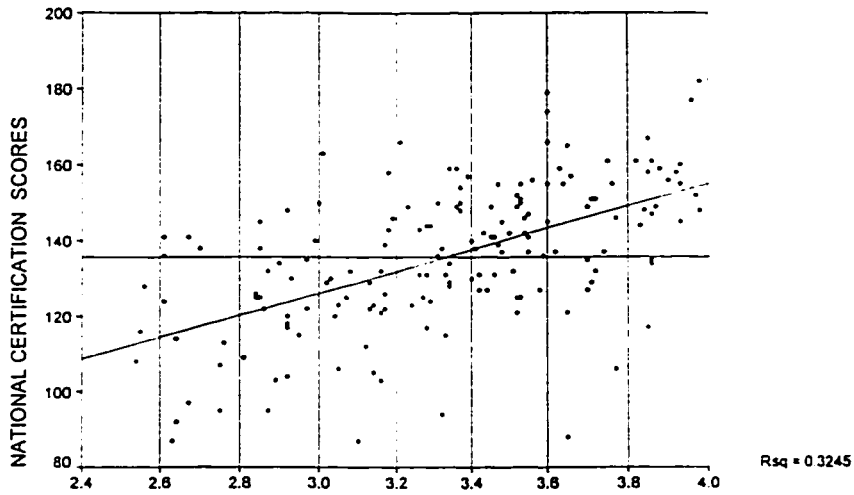
A stepwise regression analysis was completed with the (Y) axis as the dependent variable (the National Certification Examination scores) and the (X) axis the independent variable of the cumulative grade point average at graduation.

This stepwise regression analysis was performed on the aforementioned with a one-tail significance correlation, Multiple r, R squared, Adjusted R squared, Standard Error, F, Significance of F, 95 percent confidence level, B, Standard Error of B, Beta, T and Significance of T.

A Histogram and a scatterplot with a mean and intercept was completed to further support the regression analysis (Figures 23 and 24).

The report yielded an R2 of .32455 indicating that 32% of the variability in the National Certification Examination could be explained by the cumulative Graduate Grade Point averages. The statistical level of this relationship was *.00001* ($F = 81.68261$ with DF = 1).

FIGURE 23

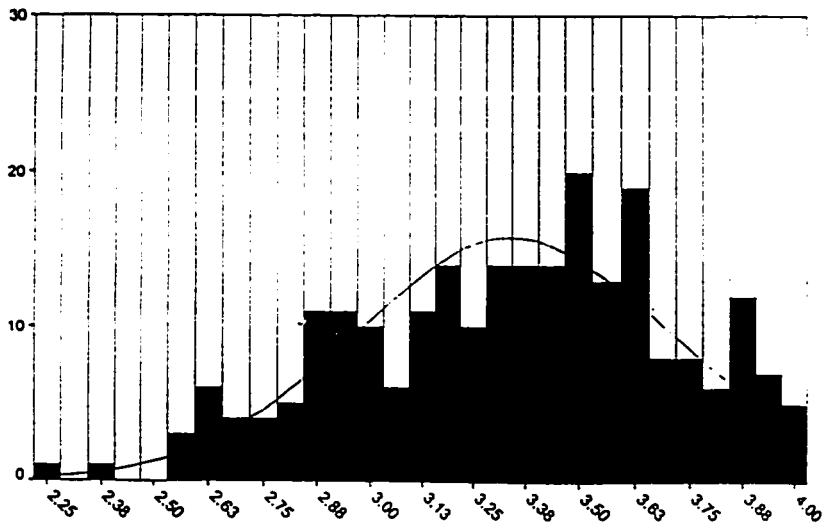


SCATTERPLOT FOR GRADUATE GRADE POINT AVERAGES

MEAN FOR NATIONAL CERTIFICATION SCORES 135.698

MEAN FOR GRADUATE GRADE POINT AVERAGE 3.340

FIGURE 24



HISTOGRAM FOR GRADUATE GRADE POINT AVERAGE

MEAN FOR GRADUATE GRADE POINT AVERAGE 3.340

It was determined apriori that in order for the hypothesis to be rejected the significance of F would have to be less than or equal to P=.05, which it was; therefore, the null hypothesis was rejected. These results are contained in Table 13.

Findings

The primary focus of this research was to determine the relationship between the dependent variable (the National Certification Examination) and the independent variables (ASSET Test Scores, General Science Course grades, the Health Information Technology Core Course grades, as well as the cumulative grade point averages upon graduation.

The analysis of the data collected to test the hypotheses revealed the following:

H_1 There was a statistical significance between the ASSET scores on admission to the college and the passing of the National Certification Examination of AHIMA.

In Hypothesis I, the null hypothesized indicates that there was not a statistical significant relationship between the ASSET Test Scores and the National Certification Examination scores.

Prior to the analysis, there was an assumption that there should be a relationship between the ASSET Test scores and the success on the National Certification Examination. This assumption was supported with the results of the multiple regression. Research and literature supported this; therefore, this finding was expected.

H_2 There was a statistical significance between a student's grades in the general college science curriculum and the passing of the National Certification Examination.

The second hypothesis focused on the relationship between the student's grades in the general college science courses and the passing of the National Certification Examination. The null hypothesis was rejected in both the Anatomy/Physiology and Pathophysiology, and the Medical Terminology I & II. A significant relationship was

TABLE 13

GRADE POINT AVERAGE AT GRADUATION

Correlation, 1-tailed Sig:

	NATSCO	GGPA
NATSCO	1.000	.570
	.	.000
GGPA	.570	1.000
	.000	.

Equation Number 1 Dependent Variable NATSCO NATIONALS SCORE

Variable(s) Entered on Step Number

1. GGPA GRADUATE GPA

Multiple R	.56969	R Square	.32455
Adjusted R Square	.32057	Standard Error	15.54729

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	1	19744.17770	19744.17770
Residual	170	41092.10137	241.71824

F = 81.68261 Signif F = .0000

---------- Variables in the Equation ----------

Variable	B	SE B	95% CI	B	Beta
GGPA	28.945788	3.202732	22.623542	35.268034	.569689
(Constant)	39.247617	10.737442	18.051727	60.443506	

---------- in ----------

Variable	T	Sig T
GGPA	9.038	.0000
(Constant)	3.655	.0003

End Block Number 1 POUT = .100 Limits reached.

Total Cases = 237

found between these variables.

H3 There was a statistical significance between a student's grades in the Health Information Technology core curriculum and the passing of the National Certification Examination.

The third hypothesis focused on the relationship between the student's grades in the Health Information Core Courses and the passing of the National Certification Examination. The null hypothesis was rejected. A significant relationship was found among these variables.

H_4 There was a statistical significance between the ASSET scores, the general science course Grades, and the Health Information core course grades and the passing of the National Certification Examination of the AHIMA.

The fourth hypothesis focused on the relationship of all the independent variables in the Health Information College Curriculum and the passing of the National Certification Examination. The null hypothesis, again, was re3ected suggesting a relationship among variables.

H_5 There was a statistical significance between a student's grade point average at graduation and the passing of the National Certification Examination of the AHIMA.

The fifth hypothesis focused on the relationship between a student's grade point average at the time of graduation and the passing of the National Certification Examination of the AHIMA. The null hypothesis was rejected, thereby establishing a statistically significant relationship between the variables.

Discussion of Findings

Twelve variables were selected for this investigation. These variables were subdivided into five groups for the multiple regression analysis. These five groups were: 1) the ASSET test scores; 2) General Science Course grades; 3) Health Information

Technology course grades; 4) a combination of 1, 2 and 3; and finally, 5) the cumulative grade point averages at graduation. These five groups were the independent variables (X). The dependent variable (Y) were the student's National Certification Examination scores.

Prior to the research study, it had been suggested by the previous literature research that there was a relationship between and among these variables, and that once these variables were entered into the SPSS 6.1 program, the analysis would support this and that there would be a statistically significant and consistent pattern of compatibility among and between the variables.

Summary

In chapter four, the analysis of the data was presented. The chapter was divided into four parts. The first section was a description of the population. The second was a restatement of the null hypotheses. The third was the data collection instrument used. The fourth was the stepwise linear and/or multiple regression analysis and its results, displayed with a brief scenario of the findings.

The focus of Chapter V is to present the findings, both generally and specifically, with conclusions and recommendations for future action.

In summarization, each null hypothesis was rejected indicating that at 43% variability, there was a significant relationship between the scores and grades of the ASSET test, the general science courses, the HIT core courses, the cumulative GPA, and success on the National Certification Examination.

CHAPTER FIVE

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

"The shrewd guess, the fertile hypothesis, the courageous leap to a tentative conclusion - these are the most valuable coins of the thinker at work." (The process of education - Jerome Bruner 1915)

INTRODUCTION

In this chapter, an attempt to summarize the findings, conclusions, and make recommendations from the study will be undertaken. The presentation is organized in the following manner: 1) the design and its methodology; 2) the results; 3) the conclusions; 4) the recommendations for action; and 5) future questions for further research.

The Design

The overall purpose of this dissertation was to investigate, evaluate and identify specific characteristics essential for an individual to apply for, study, and be successful in both the Health Information Technology program and the passing of the National Certification Examination for entrance into the Health Information Management profession.

This descriptive study drew many of its assumptions from previously published research by leading Health Information Management Professionals including: Directors, Associate Deans of Health Information programs, previous students, faculty members, and the sponsoring professional Health Information Management Association. Additional items included were the curriculum, its goals and objectives, and the practitioners suggestions from the clinical affiliations.

From the review of literature, and the experts, an assumption was formulated that the independent variable ASSET scores and grade point averages of the general science

core courses, the health information core courses, and the cumulative GPA at graduation would demonstrate a direct correlation to success on the National Certification Examination.

Several researchers reported studying previously mentioned characteristics but without success in identifying which combinations were the best measuring tool to assist college admission counselors and faculty in identifying the appropriate candidates for the Health Information programs.

Therefore, it was determined that this research was undertaken to attempt to identifv the right combination. This information would be essential in decreasing the 17% attrition rate in the Health Information college curriculum and increase the success rates on the National Certification Examination for the ART'S.

As previously stated then: the primary question throughout was to identify which characteristics are the most valuable in assessing success for the student wanting to enter the Health Information profession. This research attempted to ask that question and successfully define the answer.

Methodology

The methodology for selection of the variables and the subject matter was completed without difficulty.

As the Associate Dean for the program, it was fairly easy to identify the students who graduated from the Health Information Technology program at Baker College from 1988 through 1993, using the graduation files and the Health Information core class rosters.

First, the population consisted of 237 students from Baker College, which is a

private, not-for-profit, Midwestern school in the State of Michigan. Second, obtaining the scores from the National Certification Examination from the American Health Information Management Association with the assistance of the students was accomplished with some difficulty. We were able to obtain 172 students' scores out of 237. Realizing that this was sufficient, the gathering of data progressed nicely. The data analyzed the significance between the independent variables consisting of the pre-admission ASSET scores, the college general science courses, the Health Information core courses, and the cumulative grade point averages at graduation with the dependent variable the National Certification Examination scores.

A stepwise multiple regression statistical analysis (SPSS) was used to test the contribution of each of the variables in relationship to the dependent variable. The research hypotheses were stated in the null at the significant level of P = .05.

The methodology generally supported the research in this study. However, when the research is repeated, there are a number of factors that were not considered in this methodology that should be addressed in future studies and will be discussed in future research methods later on.

Findings

The results indicated a statistical correlation between several of the hypotheses related to the pre-admission ASSET scores, the general science course, the Health Information Technology core courses, the cumulative grade point averages and the National Certification Examination scores with some variables stronger than others. Starting with the first, assumption the findings were:

1. A correlation was identified between the ASSET test scores and the success on the

National Certification Examination. The stepwise multiple regression revealed that the ASSET scores were significant at the P = .05 level with a variability of 19%. Additionally, the analysis did reveal that the most influential ASSET test was the Writing with both the Math and the Reading scores not contributing any further statistical significance. This would indicate that the Writing score is the most important when identifying skills for the new student entering the college curriculum. The significance of the Writing score had not been previously addressed in related research as an important variable. Hinting the need for further research into the ASSET writing score needs to be developed.

Of significance, in the multiple regression analysis of single independent variables, the variability for Reading and Math were less than 10%, demonstrating that these scores did not effect the stepwise multiple regression once the Writing score was placed into the formula.

2. The general science courses added an additional 18% variability to the formula. The significance of this data demonstrated that the rote memory of Medical Terminology, although significant for the curriculum, did not influence the stepwise multiple regression procedure and scored below a statistical significance to add to the equation. Thus indicating that the Anatomy/Physiology and Pathophysiology courses were the components that played a pivotal role in the curriculum.
3. The evaluation of the Health Information core courses demonstrated that there were three courses that were important to the study. These courses were the Health Information Statistics, the indexing of diseases, and Quality Assessment. The stepwise multiple regression analysis indicated that when in combination (38%)

variability these courses could indicate success on the National Certification Examination.

4. The cumulative grade point average at graduation regression analysis was completed separately from the other combination because this score reflected the cumulative grades the students received in all of the college courses. The variability was 32%. Previous research and the literature search heavily supported the alternative hypotheses, although the results did not reflect the same combination as those in previous research.

5. Finally, the combination of the ASSET scores, the general science courses, and the Health Information Technology core courses revealed a variability of 43%. This stepwise regression, once again, identified Health Information Statistics, Indexing of Diseases, and Quality Assessment as the pivotal courses for the students to measure success on the National Certification Examination.

Conclusions

Past literature review and research had heavily supported the contention that there was a statistical significance between the previously identified variables, and if identified, would assist in helping students become successful in the Health Information Technology curriculum and on the National Certification Examination. It should, however, be noted that although these variables from past research, and from this one, are known to be related to student achievement, the research indicated that they alone are not the only factors. This analysis displayed only 43% of the total picture and that 47% of the picture was still not complete. The strength of some of the variables were stronger than others, suggesting that certain variables were more essential than others. Variables such as the

ASSET Writing at 19%; Anatomy and Physiology with Pathosphysiology at 18%; Health Information Statistics at 24%; Indexing of Diseases (Coding) at 26%: Quality Assessment at 28%; grade point average at graduation at 32%; and a combination of all variables, with the exception of the GPA, at 43% leads one to speculate that there are other factors that play a pivotal role in the success of a student in the Health Information Technology curriculum and its National Qualification Examination.

Recommendations for Action and Research

This study of the statistical significance between the independent variables identified as the ASSET scores, the general science courses, the HIT core curriculum courses, and the dependent variable of the National Certification scores was descriptive in nature and attempted to contribute to the profession and its college curriculum by identifying those factors that might add to or detract from the student's achievement.

The recommendations are divided into two sections. First is a recommendation of suggested action, and second is a series of suggestions for future research.

Action

1. This analysis supports the previous research. It further continues to identify variables essential for success in the HIT curriculum and on the National Certification Examination. The combination, according to this research (at 43% variability), indicates that ASSET Writing, Health Information Statistics, Indexing of Diseases, and Quality Assessment are the essential variables that will assist in predicting success on the National Certification Examination.
2. There was very strong suggestion that the ASSET Math score was not significant but that the Health Information Statistics course and the critical thinking

techniques used were extremely important. The conclusion that could be reached is that rote memory (ASSET MATH) is insignificant, although needed, but that Health Statistics (Critical Thinking/Analysis) are statistically significant and essential for success on the National Certification Examination and the profession.

3. The research also indicated that there are some variables more significant than others and that there was a need for course review and updating to improve the skills; i.e. Statistics, Critical Thinking, Planning, etc.

Future Research

This study should be replicated using the identical variables to support the results and if achieved with other schools within the Health Information Technology program future research should be undertaken. However, after replication is done to support the above findings further research should be completed with the following parameters including only the ASSET Writing scores, Anatomy and Physiology with Pathophysiology, computer programming courses, the Health Information Statistics course, the Indexing of Diseases courses, the Quality Assessment course, the cumulative GPA, and the Clinical Affiliations as the independent variables and the National Certification Examination as the dependent using the stepwise multiple regression analysis.

The ASSET scores are a predictor to success in College and all students must be required to take the prior to admission. They are specific predictors of student performance in the Health Information curriculum. The understanding must be that all students must successfully complete the ASSET test or take all or a combination of the developmental courses, where their aptitudes are weak, prior to admission to any college program/curriculum.

An exception in this research, which is very important, is that Baker College does not draw its students from the normal stream, but rather from adult learners and individuals not able to attend major universities because of low grades, finances, or family commitments. Yet, better than 88% of all HIT graduate students and 100% of all HIM graduate students have passed the National Boards from this school. This leads one to assess that the curriculum, although challenging, was designed to reach all levels of students motivated to succeed and the curriculum meets the essentials of the Association, the clinical affiliations, and the mastery skills inventory competencies.

As an added statement the philosophy of the school, with its open-door policy for admission, allowing everyone to have the opportunity to succeed, makes this school, its faculty, and its curriculum special for all individuals who have the motivation to try.

Summary

The problem of identifying the variables, which are most important and the combination in which they should occur, is now a part of the puzzle. The stepwise multiple regression analysis identified a strong correlation between the ASSET Writing, the Health Information Statistics, the Indexing of Diseases, Quality Assessment and success.

1) Prior to admission to college:
    a. passing the ASSET test (Reading, Writing and Math) and
    b. completion of the developmental courses, if necessary, including, but not limited to Reading, Writing, Math and study skills.
2) Health Information Statistics, Disease Classifications I and II, and Quality Assessment are the pivotal courses leading to success on the National Certification

Examination.

3) Developing critical thinking and writing skills will raise the student's basic mastery skill level.

4) Increasing the hands-on application of the mastery skills as indicated in the regression analysis with the Health Information Statistics and Disease Classification courses will increase the student's chances of success.

The solution of problems like academic achievement becomes more crucial because it involves the spending of a large amount of money, and the lives and futures of students.

This study focused on the statistical significance between selected variables and student achievement. It is hoped that future research to answer the next question will be required. If this is accomplished, the difficult task of identifying the factors for success will become a denominator in assisting colleges and faculty in addressing the admission issue of poor academic performance with these preliminary results. It is hoped that additional research into this vital area will be undertaken and will shed more light on identifying, assisting, and developing competency based curriculum, and successful students with the basic mastery skills to enter the Health Information Technology profession. As a word of warning, each institution must remember that the skills the students must have are basic and the clinical affiliations must not put added stress on the institution to turn out students with advanced skills, unless the clinical affiliations and the institutions have developed curriculum to do so.

Finally, this dissertation has revealed an urgent need for the Association, the schools of higher learning, and the clinical affiliations that the Health Information Technology

curriculum must be restructured to meet the demands being placed on the profession in the 21st Century.

This analysis indicated that increased writing skills, advanced diseases process evaluation, computer programming, and critical analysis skills were essential for success in the profession. Also the evaluation of competency must be completed on the National Certification Examination by requiring a change in the testing to evaluate the competency of the applicant with hands on evaluation of skills in analytical thinking, computers, indexing and quality assessment.

APPENDIX A:

Human Investigation exemption status

Wayne State University
Multiple Assurance# M1261
IRB# 03

Human Investigation Committee
Room 2238 Gordon H. Scott Hall
540 E. Canfield Avenue
Detroit, MI 48201
Phone: (313) 577-1628
FAX: (313) 577-1941

MEMORANDUM

TO: Cheryl A. Plettenberg/Education
(Curriculum and Instruction)
c/o Dr. Leonard Kaplan
261 Education Building

FROM: Peter A. Lichtenberg, Ph.D. Peter A. Lichtenberg, Ph.D
Chairman, Behavioral Investigation Committee

SUBJECT: Exemption Status of Protocol #H 10-70-95(B03)-X;
"A Quality Review of Variables Essential for Success in an Information Post Secondary Curriculum and the National Certification Exam"

DATE: October 25, 1995

The research proposal named above has been reviewed and found to qualify for exemption according to paragraph 4 of the Rules and Regulations of the Department of Health and Human Services, CFR Part 46.101(b).

Since I have not evaluated this proposal for scientific merit except to weigh the risk to the human subjects in relation to potential benefits, this approval does not replace or serve in place of any departmental or other approvals which may be required.

This protocol will be subject to annual review by the BIC.

HAPLMOZFB

REFERENCES

Accreditation Manual for Hospitals. (1994). Chicago, Illinois. Joint Commission on Accreditation of Healthcare Organizations.

Alreck, P.L. and Haber, A. (1985). The Survey Research Handbook. Homewood, Illinois. Richard D. Irwin, Inc. pp. 324-400.

Amatanakul, M. & Finnegan, R. (Eds). (1990). Medical Record Management (rev. ed.). Berwyn, Illinois. Physicians Record Company.

American Health Information Management Association. (1989). Certification Guide. Chicago, Illinois.

American Health Information Management Association. (1993). Certification Guide. Chicago, Illinois.

Ary, D. and Jacobs, L.E. and Rezavick, A. (1972). Introduction to Research in Education. New York City, New York. Holt, Rinehart and Winston, Inc. pp. 89-283.

Baker College. (1993). Baker College Catalog. Flint, Michigan.

Balogu, J.A. (1988). Predictors of academic and clinical performance in a baccalaureate physical therapy program. Physical Therapy. 68 (2), 238-242.

Biumenstyk, G. & Magner, D. K. (1990). As assessment draws new converts, backers gather to ask "what works?" Chronical of Higher Education. 36 (43), 811.

Bello, A. et.al. (1977). Factors which predict success of failure in an associate degree nursing program: final report. Norwalk, Conn. Norwalk Community College. Norwalk. Conn.

Bloom, B.S. (1968). A Learning of Mastery. Evaluation Comment,, 1 (2), 1-5.

Bottom, W.D. (1987). A computerized information management system for educational programs in the health sciences. Journal of Medical Education. 62 (10), 825-835.

Bruce, A.S. and Jochums, B.L. (1990). Applying problem solving methods to a clinical lab sciences curriculum. Journal of College Science Teaching. 20 (1), 38-41.

Bull, J. (1988). Analyzing academic records for informed administration. The Stanford Curriculum Study. Journal of Higher Education. 55 (1), 54-68.

Bunda, M. (1991). Capture the richness of student outcome with qualitative technique. New Directions for Institutional Research. 16 (4), 35-47.

Cofer, J. and Greeley, H.P. (1992). Quality Improvement Techniques for Medical Records. Opus Communications. Marblehead, Massachusetts. 1-15.

Doug, Steven, B. (1993). Curriculum Development and Alignment in Radiologic Technology. (ERIC Document Reproduction Service No. ED 333144.

Educators' Workshop Survey. (1984). Annual Meeting of the American Medical Record Association. Minneapolis, Minnesota.

Eichenwald, S. (1981). The development of a profile of the Medical Record Administrator. The Journal of the American Medical Association. 27 (2), 46-52.

Foster, H. J. (1983). Portfolio analysis in the planning of higher education. Higher Education. 12 (4), 389-87.

Graham, N.C. (1990). Quality Assurance in Hospitals. Aspen Publications. Gaithersburg, Maryland. Second Edition; pp 1-10.

Gupta, G. (1991). Student Attrition: A Challenge for Allied Health Education Programs. The Journal of the American Medical Association. 266 (7), 963-965.

Hardesty, L. (1980). Use a multiple regression to predict Academic Achievement at a Small Liberal Arts College. ERIC Document Reproduction Service No. ED 301476.

Heath, Zolika, A. (1988). An Application of Stark's Framework: Identification and Validation of Criteria to Evaluate Science Course Delivery Systems. (ERIC Document Reproduction Service No. ED 301476).

Huffman, E. (1972). Medical Record Management. (rev. ed.). Berwyn, Illinois. Physicians Record Company.

Huffman, E. (1980). Medical Record Management. (rev. ed.). Berwyn, Illinois. Physicians Record Company.

Huffman, E. (1985). Medical Record Management. (rev. ed.). Berwyn, Illinois. Physicians Record Company.

Kuyper, L.A. and Dziuban, C.D. (1982). Some relationships among the subtests of the registration examination. Journal of the American Medical Record Association. 53 (1), 65-67.

Kuyper, L.A. and Dziuban, C.D. (1984). Passing scores and the medical record administration examination. Journal of the American Medical Record Association. 55 (2), 29-30.

Kuyper, L.A. (1985). Total score versus subject area score--is there an association? Psychological Reports. 56, 867-973.

Marlowe, J. (1983). Before retooling your curriculum. Determine what your kids must do. American School Board Journal. 170 (12), 45-49.

Mentkowski, M. and Loacker, G. (1965). Assessing and validating the outcomes of college. New Directions for Institutional Research. (9), 47-64.

Morris, J. (1982). Predicting future performance. New Directing for Testing and Measurements. Dec. 135-40.

Osborn, C.E. (1986). A survey of medical record educational programs: Issues and problems. The Journal of the American Medical Record Association. 57-(l), 23-30.

Plevak, S.S. (1984). Predicting success in a medical record technology program. The Journal of the American Medical Record Association. 55 (11), 42-47.

Poremski, K.M. (1987). A constant charting of growth. Reed College. Liberal Education. 73 (3), 30-31.

Ricker-Bell, G. and Marshall, E. and Chekalu, E. (1991). Academic performance of mature-age and other students in a physiotherapy program. Journal of Allied Health. 20(l), 107-117.

Runyon, R.P. and Haber, A. (1988). Fundamentals of Behavioral Statistics. New York City, New York. Random House. pp. 147-423.

Sansom, K.C. (1993). Indicators of Academic Success in a health information technology program and their relationship to successful completion of the accreditation examination. The Journal of Health Information Management Research. 2(i), 60-73.

Shugars, D.A. et. al. (1991). Health America: Practitioners for 2005. An Agenda for Action for U.S.Health Professional Schools. Pew Health Commission. Durham, North Carolina.

Skurka, Margaret Flettre. (1988). organization of Medical Record Departments in Hospitals. (rev. ed.). Chicago, Illinois. American Hospital Publishing, Inc.

Skurka, M.F. (1994). Health Information Management in Hospitals. American Hospital Publishing, Inc. American Hospital Association: Chicago, Illinois.

Slovensky, D.J. (1986). [Analysis of selected variables contributing to successful performance on the Registered Record Administrator Certification Examination.] University of Alabama. Birmingham, Alabama.

The American Heritage Dictionary. (1985). Boston, Ma. Houghton Mifflin Company.

The Council on Certification and The Council on Education of the American Health Information Management Association. (1988). Essentials, Basic Guidelines. Chicago, Illinois.

Tompkins, L.S. and Harkins, C.i. (1991). Predicting Academic success in a non-traditional program. Journal of Allied Health. 19 (1), 15-24.

Wiggins, G. (1991). Toward One System of Education: Assessing to Improve, Not Merely Audit, State Policy and Assessment in Higher Education. Education Commission of the State. Denver, Colorado.

ABSTRACT

A STUDY OF VARIABLES ESSENTIAL FOR SUCCESS
IN AN INFORMATION MANAGEMENT POST-SECONDARY CURRICULUM

by

CHERYL ANN PLETTENBERG

MAY 1998

Advisor: Dr. Leonard Kaplan

Major: Curriculum and Instruction

Degree: Doctor of Education

This dissertation investigated, evaluated and identified characteristics essential for success in the post-secondary Health Information Technology curriculum, passing the National Certification Examination, and competency for entrance into the Health Information Management profession.

The hypothesis was formulated from previous research indicating that the independent variable pre-admission ASSET scores and grade point averages of the general science core courses, the Health Information core courses, and the cumulative GPA at graduation would demonstrate a direct correlation to success on the dependent variable the National Certification Examination..

This dissertation was undertaken to identify which courses are best in determining success. If identified, these courses would be a significant step forward in developing a measuring tool, and would be invaluable in decreasing the attrition rate.

The population consisted of 237 MRT students from Baker College in Michigan. A multiple regression statistical analysis (SPSS) was used to test the contribution of each

variable in the relationship to the dependent variable. The research hypotheses were stated in the null at the significance level equal to or less than P=.05.

The five hypotheses were all accepted with the suggestion that the following curriculum subjects be recommended as indicators for success on the National Certification Examination. These courses were the entry ASSET writing scores, Statistics, Coding, and QA. The cumulative stepwise multiple regression demonstrated a 43% variability.

The future testing of the reliability of this multiple regression is a follow-up analysis. If this information proves correct, then school programs and the Association would have one handle by which to evaluate prospectively, concurrently, and retrospectively which students are most likely candidates for the MRT programs, successful on the National Certification Examination, and entry-level Accredited Record Technicians (ART).

AUTOBIOGRAPHICAL STATEMENT

On August 31, 1945, Cheryl Ann Plettenberg was born in New York City, New York, and thereafter from 1949 through 1966, lived and received her formal education at St. Helen's Catholic Parochial School and Arthur Hill High School in Saginaw, Michigan. In 1966, Cheryl served in the domestic Peace Corp VISTA for three years before returning home to continue her life and education. In 1972, Cheryl began her education part time while working in the Health Information Department of St. Mary's Hospital. Cheryl received her Accredited Record Technician (ART) National Certification in 1974 and shortly thereafter, moved to Denver, Colorado and completed her Bachelor in Health Care Administration at Colorado Women's College in 1979. In 1986, Cheryl received a Master of Science degree from the University of San Francisco majoring in Public Health Administration in San Francisco, California. In 1996, a Doctorate of Education from Wayne State University in Detroit, Michigan, majoring in Curriculum and Instruction and minoring in Statistics was granted.

Cheryl has been employed in numerous positions within the Health Information Management profession. First, as a Director of Health Information Departments at Presbyterian Medical Center, in Denver, Colorado, and Las Vegas, Nevada. Than as an Associate Administrator at Sacramento Medical Center in Sacramento, California. In i988, Cheryl changed her direction and entered into the educational arena by accepting the Director of the Health Information Technology and Management educational programs at Baker College in Flint, Michigan. Recently, Cheryl accepted a challenging position as the Health Care Planner/Evaluator with the Saginaw County Department of Public Health in Saginaw, Michigan to complete the Community Assessment plan.

Cheryl has belonged to many committee's within her organization of Health Information Management including subcommittee's on Education and Quality Assessment. Cheryl is also a member of the American Healthcare Educator, an organization within the American Hospital Association.

Since 1978, Cheryl has produced many seminars, wrote a number of coding educational seminar manuals, and has been published within her professional organization.