Relationships between Academic Program Variables and Success on the Registered Health Information Administrator Certification Examination

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Abstract

The purpose of this research study was to investigate the relationships and influence of selected components of health information administration (HIA) programs and the program's percentage of graduates passing the Registered Health Information Administrator (RHIA) certification examination. Pearson product-moment correlation coefficients generated between the dependent variable and three independent variables yielded significant results. The regression model did not significantly predict a program's percentage of graduates passing the RHIA certification examination.

Introduction

The goal of health professional education programs is to provide the academic and clinical experiences necessary to prepare students to pass licensure and certification examinations. Licensure and certification examinations indicate that individuals are minimally competent to enter practice in areas such as health information management (HIM). Furthermore, administrators, educators, accrediting organizations, and future employers, as well as other constituents, evaluate overall academic program effectiveness in terms of graduates' success on these examinations.

Since its formative years, the HIM profession has recognized the importance of its certifying process to reflect the education and skills required to perform competently. [1] A program's pass rate on the RHIA certification examination is one of several measures utilized to determine the degree of HIA program quality and to assess student outcomes. [2]

The degree of HIA academic program quality and effectiveness is essential to the growth and future direction of the profession. In *Standards and Guidelines for an Accredited Educational Program for the Health Information Technician and Health Information Administrator*, the American Health Information Management Association (AHIMA) affirms that complex issues are facing higher education. Economic constraints, increased public pressure for accountability, changes in student demographics and population, enrollment and accessibility, and adaptation of information technologies to the educational experience are

among the highest concerns. Moreover, industry demands better-prepared graduates who are credentialed professionals. [3]

Purpose of the Study

The purpose of this study was to investigate the relationships and influence of selected components of HIA programs and the program's percentage of graduates passing the RHIA certification examination on the first attempt. Given the purpose, the study addresses two research questions:

1. Is there a relationship between HIA program components (resources, faculty, curriculum, students) and an HIA program's percentage of graduates passing the RHIA certification examination on the first attempt?
2. Which, if any, of the HIA program components (total program expenditures; percentage of full-time faculty with a doctoral degree; number of years of teaching experience of full-time faculty; ratio of students to full-time faculty; number of didactic, laboratory, and professional practice hours in the curriculum; mean cumulative college GPA on admission) significantly predict an HIA program's percentage of graduates passing the RHIA certification examination on the first attempt?

Review of the Literature

In addition to reviewing pertinent literature regarding the standards and guidelines for quality educational programs in HIA, a critical analysis of the empirical literature on program effectiveness and outcomes in health professional education, specifically HIA and Health Information Technology (HIT) programs, was performed. The review of the empirical literature demonstrates that allied health and nurse educators have repeatedly investigated factors related to success on certification and licensure examinations, searching for the variable or combination of variables that best predicts a student's probability to succeed. The criterion measure of success on the professional certification or licensure examination is used as the dependent variable in studies of this nature.

A review of the empirical literature found that allied health disciplines differ widely with respect to practice roles and predictor variables for examination success. Therefore, program and student variables are not always generalizable across allied health disciplines. Many variables are not predictive of performance on licensure and certification examinations. Predictor variables found to be correlated with examination success include student achievement test scores, scores on standardized college entrance examinations, and GPA. However, variables that need to be given more consideration include the organization of the program curriculum and the background of the teaching faculty. [4]

Conceptual Framework

Wholey's model of program evaluation and the HIM Education Conceptual Model give direction to the conceptual framework. Like systems and organizational theories, Wholey's model of program evaluation describes the characteristics of faculty and students and the extent to which curricular activities and fiscal resources influence the educational process and subsequent effectiveness in goal attainment. [5,6]

Wholey defines a program as a set of resources and activities directed toward one or more goals. The linkage of resource expenditures, program activities, immediate outcomes, and ultimate goals directly relates to an HIA program's performance on the RHIA certification examination. If HIA program resources are available, then qualified faculty will be recruited and retained to provide the necessary curricular instruction and learning activities. Given the appropriate faculty to develop and implement the curriculum and activities, students will be provided an opportunity to develop the required knowledge, skills, and behaviors appropriate for entry-level practice as HIM practitioners. If the appropriate curriculum and activities are implemented, then graduates will demonstrate the desired outcomes expected at the entry level for HIM practitioners. If these learning activities and outcomes occur, then progress will be made toward the HIA program goals and the ultimate goal of the HIM profession.

The ultimate goal of HIA programs is to provide competent, certified HIM professionals to meet the demands of the national healthcare information infrastructure. The framework that will be used in this study employs Wholey's model of program evaluation and the HIM Education Conceptual Model (Figure 1). Four HIA program components with key predictor variables for each are identified. First, program resources (total program expenditures) must be adequate to ensure the achievement of the learning goals and outcomes. Second, there must be sufficient faculty (student-to-faculty ratio) with the necessary qualifications (degrees earned, teaching experience) to influence program processes and outcomes. Third, the curriculum (didactic, laboratory, and professional practice hours; comprehensive examination) must support the entry-level competencies of professional practice and the achievement of learning goals and outcomes. Fourth, in order to graduate and enter professional practice, students (mean cumulative college GPA on admission) must be evaluated on the ability to demonstrate entry-level competencies measured on the RHIA certification examination.

Methodology

Design of the Study

An ex post facto design employing correlational research was used in this study. The dependent (criterion) variable was defined as an HIA program's percentage of graduates passing the RHIA certification examination on the first attempt. The independent (predictor) variables were program components consisting of total program expenditures; percentage of full-time faculty with a doctoral degree; number of years of teaching experience of full-time faculty; ratio of students to full-time faculty; number of didactic, laboratory, and professional practice hours in the professional curriculum; and mean cumulative college GPA of students on admission.

Population

The population for this study was the 46 accredited HIA programs in the United States during the 2000–2001 and 2001–2002 academic years. No sampling was performed, as the entire population was utilized in the study. Of 46 HIA programs, 33 programs (72 percent) responded to the questionnaire and participated in the study.

Instrumentation

Questionnaire. A questionnaire was developed to collect HIA program data relating to the RHIA certification examination pass rates of graduates in the 2000–2001 and 2001–2002 academic years. A panel of recognized educators who serve in leadership positions in the field of HIM education reviewed the HIA program questionnaire for content validity to determine the extent to which items adequately represented the variables being measured. A pilot test using educators in HIM academic programs was conducted employing the cover letter and revised questionnaire.

RHIA Certification Examination. This study utilized the RHIA certification examination to collect data relating to the pass rates of graduates in the 2000–2001 and 2001–2002 academic years. The Council on Certification (COC) of AHIMA, in collaboration with Applied Measurement Professionals (AMP), developed the certification examination based on entry-level competencies. These competencies were determined through a job analysis study conducted on entry-level practitioners. [7] The certification examination tests only content pertaining to these competencies. The passing score for both the 2001 and 2002 RHIA certification examinations was 103 correct answers. [8,9]

Data Collection

The program directors of all 46 accredited HIA programs in the United States were mailed a cover letter and an HIA program questionnaire pertaining to program components (independent variables) and the pass rates of graduates (dependent variable). The cover letter to the HIA program director described the purpose of the study, encouraged participation, and promised program confidentiality. Included in the mailing was a sample of a completed survey instrument to help ensure accuracy of the data collected and a letter of support from AHIMA's vice president for education and accreditation.

Program pass rates of 2000–2001 and 2001–2002 graduates on the RHIA certification examination were obtained through the AHIMA COC in conjunction with AMP. Only the first-time candidate pass rates were collected for each program. Program data from the 2000–2001 academic year were used to cross-validate results from the 2001–2002 academic year. Univariate analysis of the data finds that results from both academic years represent the same population.

Results

Program Characteristics

The descriptive characteristics of the HIA programs that responded to the HIA program questionnaire are presented in Table 1 and Table 2. General demographic characteristics include the type of sponsoring institution of the HIA program and the type of degree awarded. Program characteristics include variables representative of the resources (total program expenditures), faculty (student-to-faculty ratio, degrees earned, teaching experience), curriculum (didactic, laboratory, and professional practice hours; comprehensive examination), students (mean cumulative college GPA on admission), and percentage of graduates passing the RHIA certification examination on the first attempt.

Findings indicated that the means for all program variables, except laboratory contact hours, increased slightly from 2000–2001 to 2001–2002. Large variations in the standard deviation of each program variable were noted for both years.

Answers to Research Questions

Is there a relationship between HIA program components (resources, faculty, curriculum, students) and an HIA program's percentage of graduates passing the RHIA certification examination on the first attempt?

Table 3 presents the Pearson product-moment correlation coefficient computations across both academic years. Results found similarities and differences between the two academic years. The Pearson correlation coefficient generated between an HIA program's pass rate and total program expenditures yielded a weak to moderate positive correlation ($r(19) = .49$, $p = .04$) for 2000–2001. However, an HIA program's pass rate had no correlation ($r(19) = .39$, $p = .10$) with total program expenditures in 2001–2002.

The Pearson product-moment correlation coefficient generated between a program's pass rate and percentage of HIA full-time faculty with a doctoral degree found no significant relationship ($r(26) = .28$, $p = .17$) for 2000–2001. There was no correlation ($r(27) = .14$, $p = .49$) between a program's pass rate and percentage of HIA full-time faculty with a doctoral degree for 2001–2002.

The Pearson correlation coefficient calculated between the HIA program's pass rate and the average number of years of HIA and HIT teaching experience of the full-time faculty yielded no statistically significant relationship ($r(26) = -.17$, $p = .42$) in 2000–2001. There was no statistically significant correlation ($r(27) = .37$, $p = .06$) between the HIA program's pass rate and the average number of years of HIA and HIT teaching experience of the full-time faculty in 2001–2002.

The Pearson correlation coefficient generated a weak to moderate negative relationship ($r(21) = -.45$, $p = .04$) between an HIA program's pass rate and the ratio of students to full-time faculty for 2000–2001. In 2001–2002, there was no statistically significant correlation ($r(21) = -.19$, $p = .41$) between these two variables.

The Pearson correlation coefficient was calculated between an HIA program's pass rate and the number of didactic, laboratory, and professional practice contact hours. The Pearson correlation coefficient between the HIA program's pass rate and the number of didactic ($r(26) = .04$, $p = .83$), laboratory ($r(26) = -.04$, $p = .86$), and professional practice ($r(26) = -.32$, $p = .11$) contact hours was not statistically significant for 2000–2001. Likewise, there was no significant correlation for the 2001–2002 data (didactic $r(27) = .11$, $p = .60$; laboratory $r(27) = -.04$, $p = .85$; professional practice $r(27) = -.35$, $p = .07$).

There was a moderate positive Pearson correlation ($r(20) = .53$, $p = .02$) between the HIA program's pass rate and the mean admission GPA of students for 2000–2001. However, there was no significant correlation ($r(20) = –.06$, $p = .81$) between these two variables for 2001–2002.

Which, if any, of the HIA program components (total program expenditures; percentage of full-time faculty with a doctoral degree; number of years of teaching experience of full-time faculty; ratio of students to full-time faculty; number of didactic, laboratory, and professional practice hours in the curriculum; mean cumulative college GPA on admission) significantly predict an HIA program's percentage of graduates passing the RHIA certification examination on the first attempt?

Pearson correlation coefficients were calculated between the HIA program's percentage of graduates passing the RHIA certification examination and the program component variables and the correlation coefficients among program variables by year (see Table 4 and Table 5). Three HIA program components significantly correlated with the criterion measure in 2000–2001. The strongest positive correlation ($r(20) = .53$, $p = .02$) existed between the HIA program's percentage of graduates passing the RHIA certification examination and the mean cumulative college GPA of students on admission to the program. A second positive significant relationship ($r(19) = .49$, $p = .04$) was between the program's pass rate and total program expenditures. A negative correlation ($r(21) = –.45$, $p = .04$) existed between the program's pass rate and the ratio of students to full-time faculty. There were no HIA program components that significantly correlated with the pass rate in 2001–2002.

After checking the statistical assumptions, the HIA program's percentage of graduates passing the RHIA certification examination was regressed on the program component variables. Five program variables reflecting the conceptual framework were entered into the regression model for the two academic years. These program variables included the mean cumulative college GPA of students on admission, total program expenditures, the ratio of students to faculty, the number of professional practice contact hours in the curriculum, and the average number of years of teaching experience of full-time faculty. Results of the regression model ($F(5) = 2.21$, $p = .14$, $R^2 = .55$) were not statistically significant for 2000–2001. Likewise, the regression model ($F(5) = 1.16$, $p = .40$, $R^2 = .42$) was not statistically significant for 2001–2002.

Conclusions

Based on pertinent literature regarding the standards and guidelines for quality educational programs in HIA and a critical analysis of the empirical literature on program effectiveness and outcomes in HIM education, it was expected that significant relationships and differences between an HIA program's percentage of graduates passing the RHIA certification examination and program components would be found. This conclusion was not reached in this study.

A generalized conclusion from the study results was that there are less significant relationships between the HIA program's percentage of graduates passing the RHIA certification examination and program components than was thought prior to the study being conducted. However, relationships were found.

The HIA program variables used in the conceptual framework were not sensitive in predicting RHIA certification examination success. However, if different independent variables were entered in the framework, HIA program performance might be predicted. A review of the empirical literature suggests other predictors of examination performance that this study did not investigate. These predictor variables include students' achievement test scores, scores on standardized college entrance examinations, level of education prior to admission, age, and graduation GPA.

The HIA Model Curriculum provides a benchmark for baccalaureate degree education in HIA.[10] However, this study confirmed that wide variations exist among HIA programs in resource allocation, faculty staffing levels, curriculum development, and admission criteria. The academic setting of each HIA program is diverse, varying according to the sponsoring institution's mission in addition to state standards and guidelines.

According to the *Standards and Guidelines for an Accredited Educational Program for the HIT and HIA Accreditation Manual*, the HIA program must be responsive to the demonstrated needs and expectations of the various communities of interest (students, graduates, faculty, college administration,

employers, and the public).[11] Therefore, the communities of interest can have a strong influence on the program components of resources, faculty, curriculum, and students. Consequently, it is sometimes difficult for all HIA programs to implement identified national benchmarks that are not in concert with the communities' needs and expectations.

Based on study results, periodic outcome assessment of individual HIA programs should continue through the national accreditation process. Additionally, faculty at the local level should continue program self-analysis. Student academic performance and subsequent graduate performance on the national certification examination should be continuously monitored with appropriate action taken to improve program quality and effectiveness. Therefore, student progress toward achievement of learning outcomes and entry-level competencies will meet the needs of the national healthcare information infrastructure.

Previous research examined the influence of student variables on licensure and certification examination performance. Even though the present research revealed few relationships between the criterion measure and program variables, it is widely accepted that the HIA program components impact the national healthcare information infrastructure. The linkage between educators, students, and curriculum yields graduates who obtain RHIA credentials to meet HIM work force needs. [12]

Limitations

The following limitations should be considered when interpreting the results of this study:

1. Only HIA programs were surveyed. Generalizations to HIT programs and other allied health education programs cannot be made.
2. If data had been collected from the nonrespondents (28 percent), a different interpretation of the findings may have resulted. The data requested on the questionnaire may have been viewed by some, particularly by the nonrespondents, as too sensitive for release to an outsider.
3. Some HIA programs had a small percentage of graduates take the RHIA certification examination. Study results were limited to the certification examination data available on these graduates.
4. Obtaining data through a mailed questionnaire has inherent limitations in that one is never sure of the conditions in which it was answered. Self-report surveys are valid only to the extent that respondents provide accurate information.

Recommendations for Further Study

Based on the findings and conclusions of the study, future research should include the following:

1. Continued monitoring is needed to examine the ongoing, longitudinal effect that academic and nonacademic factors have in influencing pass rates on the RHIA certification examination.
2. Further research efforts need to investigate the effects that HIA student variables have on the percentage of graduates passing the RHIA certification examination. Research utilizing the student variables of GPA at graduation, grades in HIM courses (didactic, laboratory, and professional practice), and prior HIM work experience may yield significant relationships and influence on RHIA certification examination success.
3. Future research should be conducted to replicate the current study with the HIT program population. Differences in program resources, faculty, curriculum, and students in the HIT population, as compared with the HIA population, are worthy of study.
4. Investigation into the decline in the number of HIA program graduates taking the RHIA certification examination should be conducted. As an outcome assessment measure, program

        pass rates can be directly impacted by the number of graduates taking the certification examination. Credentialed HIM professionals are necessary to meet the supply and demand of the healthcare job market.

5. Reconceptualization of the interaction of HIA program variables and the effect of the variables on the RHIA certification examination pass rate should be examined. A different statistical model of the relationships between and among pass rate and HIA program components might yield different results.

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Notes

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Figure 1

Conceptual model depicting interrelatedness of HIA program components.
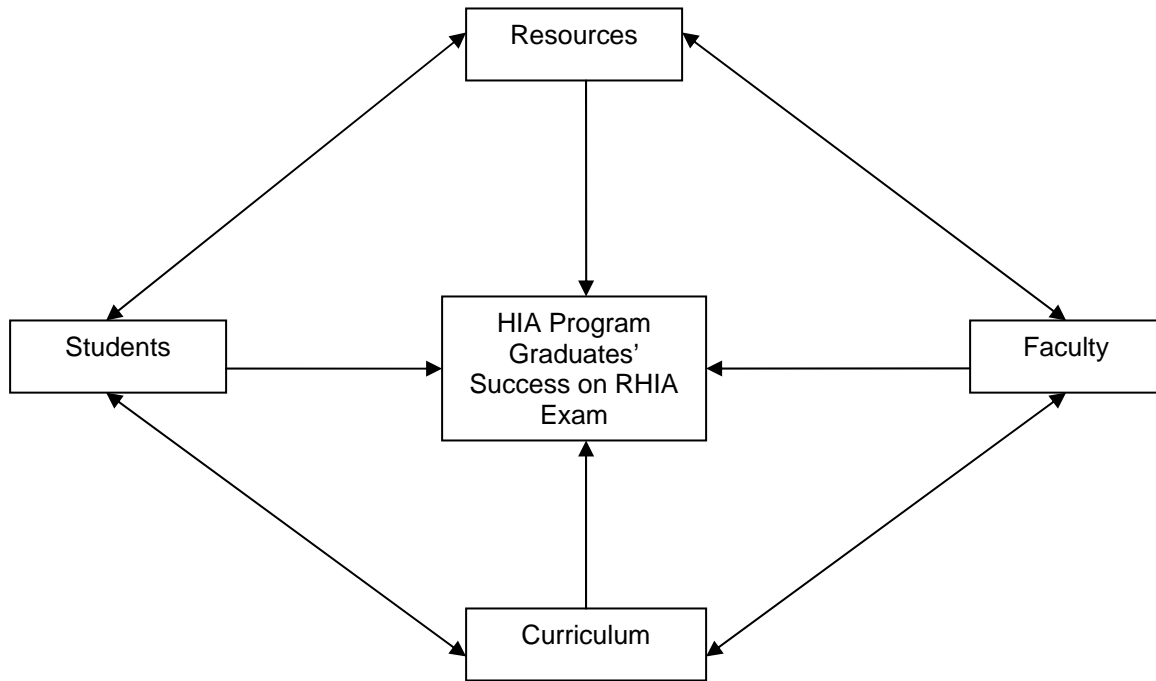
Table 1

HIA Program Descriptive Statistics for 2000–2001

Variable	*n*	*M*	*SD*	Skewness	Kurtosis
Percentage of graduates passing RHIA certification examination	26	88.18	14.92	-1.35	1.00
Total program expenditures	22	$230,867	$110,458	1.03	1.23
Percentage of faculty with a doctoral degree	29	14.97	24.64	1.61	1.71
Average years of teaching experience of faculty	29	14.25	7.54	0.58	-0.41
Ratio of students to faculty	24	10.58:1	8.95	1.68	2.49
Didactic contact hours	29	671.79	226.35	-0.88	0.77
Laboratory contact hours	29	166.14	123.99	1.72	5.04
Professional practice contact hours	29	317.10	150.37	0.63	1.68
Mean admission GPA of students	22	2.99	0.23	-0.17	-0.25

Table 2

HIA Program Descriptive Statistics for 2001–2002

Variable	*n*	*M*	*SD*	Skewness	Kurtosis
Percentage of graduates passing RHIA certification examination	27	90.41	14.41	-1.94	3.77
Total program expenditures	23	$241,596	$ 99,986	0.05	-1.25
Percentage of faculty with a doctoral degree	31	16.72	25.34	1.38	0.75
Average years of teaching experience of faculty	31	14.63	7.51	0.73	-0.26
Ratio of students to faculty	25	11.52:1	9.37	1.90	4.10
Didactic contact hours	31	691.81	234.28	-0.81	0.55
Laboratory contact hours	31	161.29	126.44	1.48	4.09
Professional practice contact hours	31	321.39	142.50	0.72	2.02
Mean admission GPA of students	23	3.05	0.20	0.94	1.59

Table 3

Pearson Correlation Coefficients between HIA Program Pass Rate and Program Components by Year

Variable	Pass Rate 2000–2001	Pass Rate 2001–2002
Total program expenditures	.49*	.39
Percentage of faculty with a doctoral degree	.28	.14
Average years of teaching experience of faculty	–.17	.37
Ratio of students to faculty	–.45*	–.19
Didactic contact hours	.04	.11
Laboratory contact hours	–.04	–.04
Professional practice contact hours	–.32	–.35
Mean admission GPA of students	.53*	–.06

*$p < .05$

Table 4

Pearson Correlation Coefficients between Pass Rate and Program Component and among Program Components for 2000–2001

	pasrat	totexp	perdeg	avtexp	ratstf	didcon	labcon	ppecon	admgpa
pasrat	1.00								
totexp	.49*	1.00							
perdeg	.28	.47*	1.00						
avtexp	–.17	–.30	–.09	1.00					
ratstf	–.45*	–.44*	–.28	.34	1.00				
didcon	.04	–.05	.05	–.05	.23	1.00			
labcon	–.04	.10	–.10	–.03	–.12	.08	1.00		
ppecon	–.32	–.25	–.04	.33	.48*	.13	–.02	1.00	
admgpa	.53*	.51*	.07	–.04	–.35	–.14	.01	–.31	1.00

Note: pasrat = program's percentage of graduates passing the RHIA certification examination; totexp = total program expenditures; perdeg = percentage of full-time faculty with a doctoral degree; avtexp = average number of years of teaching experience of full-time faculty; ratstf; ratio of students to full-time faculty; didcon = didactic contact hours; labcon = laboratory contact hours; ppecon = professional practice contact hours; admgpa = mean cumulative college GPA of students on admission

*$p < .05$

Table 5

Pearson Correlation Coefficients between Pass Rate and Program Component and among Program Components for 2001–2002

	pasrat	totexp	perdeg	avtexp	ratstf	didcon	labcon	ppecon	admgpa
pasrat	1.00								
totexp	.39	1.00							
perdeg	.14	.33	1.00						
avtexp	.37	−.24	−.14	1.00					
ratstf	−.19	−.40	−.31	.30	1.00				
didcon	.11	−.14	.04	−.12	.27	1.00			
labcon	−.04	.10	−.15	.02	−.05	−.02	1.00		
ppecon	−.35	−.32	−.07	.33	.27	.06	−.00	1.00	
admgpa	−.06	−.07	.08	−.29	−.13	.02	−.04	−.43*	1.00

Note: pasrat = program's percentage of graduates passing the RHIA certification examination; totexp = total program expenditures; perdeg = percentage of full-time faculty with a doctoral degree; avtexp = average number of years of teaching experience of full-time faculty; ratstf = ratio of students to full-time faculty; didcon = didactic contact hours; labcon = laboratory contact hours; ppecon = professional practice contact hours; admgpa = mean cumulative college GPA of students on admission

$*p < .05$