

***Entry-Level Baccalaureate Degree Education
in Health Information Management:
Reform for the 21st Century***

**Assembly on Education
American Health Information Management Association**

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Preamble

Over the last five years the American Health Information Management Association (AHIMA) has been engaged in a number of activities related to educational reform in the profession.¹ The AHIMA recognizes that advances in information technology, the changing healthcare marketplace and the demand for practitioners who are capable of assuming additional higher-level skills necessitate curriculum reform within the profession. Curriculum reform may mean extensive change for some academic programs. Or, it may mean programs reorganize, restructure or simply do better some of the things that they already are doing.²

The Board of Directors (BOD) of the AHIMA commissioned the Assembly on Education (AOE) to look at curriculum reform in the profession and to develop curriculum models for associate, baccalaureate and masters degree levels of professional education in health information management (HIM). In addition, the AOE was commissioned to develop resource products to assist in curriculum development efforts. In 1994, six workgroups were formed to begin work on the model curriculum. Products of their efforts were subsequently validated by the 1994 AOE Symposium participants and used as a basis for further curriculum development activity by the 1995 AOE Curriculum Project Workgroup. The goal of the Workgroup was to produce curriculum models that provide direction in the design of HIM curricula. This document is the product of the Curriculum Project Workgroup's efforts in regard to baccalaureate degree education in health information administration (HIA).

Introduction

In designing the curriculum model, the Workgroup reviewed a variety of reports and studies related to educational reform,^{3,4,5} the future of allied health education,^{6,7,8,9} previous HIM educational initiatives,^{10,11,12,} and other professional associations' curriculum projects.^{13,14,15} The Workgroup reflected carefully on the key issues raised by these documents and concluded that HIM professional education must meet the needs of a continuously changing environment while requiring a rigorous course of study to prepare graduates for diversified practice in the healthcare industry.

The Workgroup recognized that there is an increasing desire to educate students in life skills (i.e., critical thinking, problem solving, literacy, etc.) as well as professional skills. The life and professional skills are seen as mandatory in order for graduates to assume the role of life-long learners who are capable of functioning in a technologically advanced and changing work environment. Graduates must be innovative and adaptable critical thinkers and problem solvers who are capable of using available services and technologies to support the operations, management and decision making within an enterprise.

To assist students in acquiring the skills necessary to function in this work environment, the Workgroup sought to present a curriculum model that would:

- 1) address the evolving professional skills of baccalaureate degree students,
- 2) emphasize the life skills necessary to function in a changing environment, and
- 3) address the educational strategies necessary for educating self-directed learners.

The model provides a benchmark for entry-level baccalaureate degree education in HIM. Implicit in the design of the model is its flexibility as it relates to individual programmatic goals and standards and communities of interest. The model should be used as a guide to modernize, update or revise curricula as needed. It is intended to be used in concert with

the ongoing professional roles and functions studies conducted by AHIMA and the Essentials for an Accredited Program for the Health Information Administrator. The contents of the model should be viewed as a **complement** to these documents.

The remainder of this document discusses the curriculum model. It concludes with a discussion of the issues of core curriculum and multiskilling in allied health. The model is divided into the following sections:

- Mission of HIM Education
- HIM Practice Definition
- Occupational Title
- Task Responsibilities
- Uniqueness of Baccalaureate Degree Curriculum
- Transcurricular Content and Outcomes
- Curricular Content and Competency Levels
- Clinical Experience
- Sample Curriculum by Credit Hour
- Educational Strategies and Assessment
- Staffing Levels and Faculty Qualifications
- Computer Laboratory

Curriculum Model

Mission of Health Information Management Education

A mission statement serves as a general framework within which an organization can establish certain policies, objectives and/or guidelines. The Workgroup developed a general mission statement of HIM education for faculty to use as a guide and for society in general to understand the profession's responsibility to professional education and research. Although academic programs may formulate their own mission statements, it is understood that curricula will be structured in the spirit of the HIM educational mission with necessary adjustments made to accommodate the respective educational degree levels and communities of interest.

Health information management education is responsible for preparing confident, innovative, and contributing professionals who can identify and use a variety of information resources and technologies to accomplish the objectives of diverse practice environments. It provides students with the knowledge and skills necessary to become self-directed learners who possess critical- thinking and problem-solving abilities as well as communication and interpersonal skills. It instills a commitment to life-long learning and important ethical values. The educational process fosters the acquisition of leadership abilities and systems thinking necessary for adapting careers within a changing healthcare environment. As practitioners, graduates of programs will serve society and the profession through collaborative practice, innovative teaching, and the generation and application of new knowledge about health information management.

Health Information Management Practice Definition

Health information management represents a continuum of practice concerned with health-related information and the management of systems to collect, store, process, retrieve, analyze, disseminate and communicate information related to the research, planning, provision, financing and evaluation of healthcare services.

Occupational Title

Graduates of baccalaureate degree educational programs are known as health information administrators. Entry-level health information administrators may be employed in a variety of settings and they may assume a variety of job titles depending upon their education, work experience and place of employment. Common job titles held by health information administrators in today's job market are related to line, staff and/or technical positions such as: director, assistant director, manager, claims analyst, clinical information analyst, etc. It is anticipated that job titles will change (e.g., information engineer, clinical information coordinator, data administrator, information security officer, etc.) as healthcare enterprises expand their reliance on information systems and technology. Health information administrators have, and will continue to assume, roles that directly contribute to the development of computer-based patient record systems and a national health information infrastructure. Presently, opportunities for practice are found in numerous settings such as acute care general hospitals, managed care organizations, consulting firms, claims and reimbursement organizations, accounting firms, home healthcare agencies, long-term care facilities, corrections facilities, drug companies, behavioral healthcare organizations, insurance companies, state and federal healthcare agencies, healthcare computing industries, etc. Practice opportunities are unlimited.

Task Responsibilities

The tasks or functions performed by health information administrators are numerous and are continually changing within the work environment. While the job title and work setting will dictate the actual tasks performed by the health information administrator, in general this individual performs tasks related to the management of health information and

the systems used to collect, store, process, retrieve, analyze, disseminate and communicate that information regardless of the physical medium in which information is maintained. In addition, health information administrators assess the uses of information and identify what information is available and where there are inconsistencies, gaps and duplications in health data sources. They are capable of planning and designing systems and serving as pivotal team members in the development of computer-based patient record systems and other enterprise-wide information systems. Their task responsibilities also include serving as brokers of information services. Among the information services provided are design and requirements definition for clinical and administrative systems development, data administration, data quality management, data security management, decision support design and data analyses, and management of information-intensive areas such as clinical quality/performance assessment and utilization and case management.

Uniqueness of the Baccalaureate Degree Curriculum

The uniqueness of baccalaureate degree education for health information administrators is found in the environment in which the curriculum is taught, the employment setting of its graduates and the blending of course work which comprises health information management. The baccalaureate degree curriculum represents a synthesis of curricular content drawn from general education, organizational behavior, principles of management, and information systems and technologies coupled with a unique understanding of the biomedical sciences and the healthcare environment and health information content and uses. The curriculum is supported by instructional strategies that are focused upon the development of professional attributes necessary to

exercise leadership in the accomplishment of organizational objectives through the appropriate uses of information. It is important to note that while the associate and baccalaureate curricula share common curricular foundations, they seek to accomplish significantly different outcomes, particularly with respect to the background in information technologies, statistics, and strategic organizational information resources management. The expertise of the associate degree graduate lies in the application of information technologies to support healthcare information operations. The expertise of the baccalaureate degree graduate lies in the interpretation, analysis, and design of information systems, and management of healthcare information resources and services.

Transcurricular Content and Outcomes

Over the last ten years significant attention has been paid to the integration of liberal arts and professional education studies as a way of educating a workforce that is prepared to meet the needs of a changing, high performance work environment. The work of the University of Michigan's Professional Preparation Network Project¹⁶ suggests that professional education programs should be educating students who can demonstrate the following competencies upon graduation:

- Conceptual Competence: Understanding the theoretical foundations of the profession.
- Technical Competence: Ability to perform skills required of the profession.
- Integrative Competence: Ability to meld theory and skills in the practice setting.
- Career Marketability: Becoming marketable due to acquired education and training.

In addition, the Network Project identified eight educational outcomes that are common in liberal arts education (Appendix A). Based on these outcomes and the dynamic changes taking place within the profession, the Curriculum Workgroup identified specific educational outcomes that were believed to exemplify the well-educated health information administrator of today and tomorrow. Faculty are encouraged to design curricula which foster the attainment of the following outcomes:

Critical Thinking Skills

- Conceptualize, analyze, develop, and implement solutions in a fluid, dynamic, heterogeneous healthcare setting.

Personal Initiative in Education and Career Planning

- Assume new roles through continually learning new concepts, technologies, and techniques.
- Assume responsibility for personal mastery through continual clarification of what is important to pursue and development of personal vision.
- Demonstrate commitment and a strong sense of responsibility to work.

Communication

- Communicate effectively through use of skills in speaking, reading, writing, and listening.
- Analyze situations and formulate and articulate appropriate communication patterns.

Customer Service Orientation

- Recognize potential customers, assess their needs, and deliver quality and timely services.

Sensitivity to Healthcare Delivery Environment

- Determine needs of a heterogeneous and fluid healthcare environment and adapt skills to meet these needs.

Sensitivity to Cultural and Community Needs

- Communicate and relate to diverse customer, patient, and professional communities.

Leadership and Collaboration

- Develop and articulate vision and motivate others to build and execute a shared vision.
- Effectively function in the dynamics of interdisciplinary group process and team collaboration.

Professional Behavior

- Demonstrate professional behaviors in all interactions with peers, patients, customers, and other professionals.
- Adhere to ethical, legal, and professional practice standards.
- Consider ethical implications and choose appropriate course of action.

Strong Foundation in the Sciences

- Demonstrate application of the life sciences, research methodologies, mathematics, and statistics appropriate to the needs and functions of the task at hand.

Strong Foundation in Management, Legal, and Financial Perspectives

- Demonstrate application of concepts and techniques associated with:
 - Human resources management
 - Organizational behavior and change management
 - Treatment cost and outcomes analysis
 - Resource consumption and supply utilization
 - Budget preparation and implementation
 - Reimbursement issues
 - Analysis of information for clinical and administrative purposes
 - Professional ethics
 - Confidentiality and personal privacy

Strong Foundation in Information and Systems Sciences

- Demonstrate application of concepts, techniques, and tools associated with:
 - Information systems planning and analysis
 - Information systems evaluation
 - Information collection, archiving, retrieval, and analysis
 - Information usage

Curricular Content

The recommended baccalaureate degree curriculum emphasizes a systems perspective that focuses on providing or brokering a unique set of health information services. It intends to develop skills for the management of health-related information and the systems used to collect, store, retrieve, disseminate and communicate information for the support of enterprise operations and clinical and business decision making in healthcare or related organizations.

The curricular content was identified through a series of activities which included a review of the literature and input from practitioners, faculty, and other interested individuals through envisioning forums and workgroup meetings.¹⁷ In 1994, six AOE workgroups identified tasks and developed knowledge clusters and units which were validated by participants at the 1994 AOE Symposium and the AHIMA Annual Convention. Data from these workgroups and subsequent validation efforts were used by the Project Workgroup to design the curricular content of the model. The model in general, along with the curricular content, has been widely disseminated and presented and discussed at numerous educational and professional meetings. The Workgroup identified and included relevant modifications to the curricular content and model based on the responses received through these activities. The recommended curricular content is comprised of general and professional education requirements. The integration of these requirements is imperative to the development of professional attributes necessary to function in a rapidly changing environment and high performance workplace.

General Education

For the purpose of this report, general education is defined as those courses which students are required to complete outside of the professional major which foster the skills necessary to function as responsible adults and contributing members of society. Professional education is defined as those courses students are required to complete to develop specialized knowledge and skills in a chosen field.¹⁸ Figure 1 displays the recommended general education requirements for the health information administration baccalaureate degree curriculum.

Figure 1: General Education Requirements for Health Information Administration Curriculum

Intent: To prepare practitioners who are capable of understanding society and their roles in it. General education elements should be interspersed throughout the curriculum in an effort to enhance the educational outcomes expected of program graduates. General education should include, but is not limited to the following:

- Oral and written communication skills
- Social and Behavioral Sciences
- Humanities
- Microcomputer literacy
 - Word processing
 - Spreadsheets
 - Database management
 - Graphics and presentation
- General Sciences
- Mathematics

Professional Education

The professional education requirements are comprised of 12 **knowledge clusters** which represent broad domains of content. The clusters are further defined by **knowledge units** which represent more detailed content areas within the clusters. The recommended content areas do not equate to specific courses but represent a continuum of practice with the depth and breadth of the clusters and units varying by institutional prerogative, community of interest and the marketplace for health information administrators. A schematic view of the model curriculum is found in Figure 2. The model denotes a hierarchical process that evolves from basic general education requirements to practice expectations, all of which help to build the attributes necessary to achieve the educational outcomes previously discussed.

Figure 2: Health Information Administration Model Curriculum 1995

As mentioned, the knowledge clusters have been further defined by knowledge units. For curriculum development purposes, each of the units has been assigned a suggested competency level which the Workgroup felt best indicates the extent of knowledge and expertise that should be developed in students. But each program should assign competency levels based on its own marketplace and community of interest. The scale used to define the competency levels was adapted from Longenecker, et al.¹⁹ and is found in Figure 3. The recommended curricular content as defined by knowledge clusters and units along with the competency level assignment is found in Figure 4.

Figure 3: Competency Levels	
1 = Awareness	Introductory recall and recognition
2 = Literacy	Knowledge of framework and content
3 = Concept	Comprehension, translation, extrapolation and interpretation of meaning
4 = Detailed Understanding	Appropriate application of knowledge in a structured or controlled context
5 = Skilled Use	Application using analysis, synthesis, and evaluation in new situations

Clinical Experience

Clinical experience should move from a model of rotation throughout the areas of the health information management department to a project model. Students should be given problems and projects to complete in enterprises. These projects may be included in separate clinical education courses or incorporated into classes within the didactic content to which they apply and/or developed as simulated clinical practice modules. The student's education should end with a capstone experience such as an internship, thesis or other major independent project. The purpose of the capstone experience is to integrate knowledge, behaviors, and professional attributes acquired throughout the curriculum.

Sample Curriculum by Credit Hour

Figure 5 provides a list of suggested courses with quarter and semester hour designations for illustration purposes. The sample curriculum is offered as an **example** of a course configuration derived from the knowledge clusters and knowledge units. The course titles reflect either knowledge clusters or units within the clusters. If a knowledge cluster title is used as a course title, then the reader should assume that the units listed under that cluster are included within the course. Some of the suggested courses may be identified as prerequisite courses (i.e., anatomy, physiology, microcomputers, programming, etc.). General education credit designation is not listed. In actuality the total credit hours in the curriculum will be predicated on the requirements of the academic institution, input from communities of interest, competency level assignment and the need to provide students with a sound program that will lead to the achievement of the educational outcomes as described in this report.

Figure 5: Sample Curriculum for Health Information Administration Program

Content	Quarter Hrs	Semester Hrs
Biomedical Sciences		
Anatomy	5	4
Physiology	5	4
Language of Medicine	3	2
Pharmacology	2	1
Medical Science	5	4
Information Technology		
Microcomputer Applications	3	2
Programming	4	3
System Architectures and Operating Systems	4	3
Introduction to Database Concepts	3	2
Data Communications	3	2
Healthcare Delivery Systems	3	2
Legal Aspects of Healthcare and Ethical Issues	3	2
Organization and Management		
Managerial Principles	4	3
Human Resources Management and Development	3	2
Financial Management for Healthcare	3	2
Organizational Behavior and Interpersonal Skills	4	3
Quantitative Methods and Research Methodologies		
Introductory and Advanced Healthcare Statistics (Epidemiology)	6	4
Research Methods in Healthcare	3	2
Healthcare Information Requirements and Standards	3	2
Healthcare Information Systems		
Computer Applications in Healthcare	3	2
Systems Analysis and Design	4	3
Health Data Content and Structures	3	2
Classification, Nomenclature and Reimbursement Systems	4	3
Clinical Quality Assessment and Performance Improvement	3	2
Biomedical and Health Services Research Support	3	2
Health Information Services Management	6	4
Capstone Experience/Practicum/Project	3	2
Total Hours	99	71

Educational Strategies and Assessment

The Curriculum Workgroup recognized that to educate students for a future characterized by change and increased dependency on information and technology, the curriculum must enable students to think rationally and creatively, solve problems, manage and retrieve information, communicate effectively and continuously learn.²⁰ Curricula should be structured in such a manner that students become active life-long learners who are capable of creating their own knowledge after interacting with information from a variety of resources, (i.e., printed material, electronic databases, laser videodiscs, etc.). It is important for students to become information literate and to acquire the skills necessary to solve problems. For example, the Wisconsin Educational Media Association offers a concise guide on information problem-solving skills that faculty may find helpful in designing student activities (see Appendix B). Teachers or faculty must serve as facilitators or coaches and help direct students toward the attainment of skills that will make them self-directed learners. It is recommended that faculty move away from a reliance on lecturing and foster a more case-based or problem-based approach to curriculum design. This calls for the development and use of case studies, simulations, discussion lessons, paper writing and rewriting exercises and frequent oral presentations. Faculty should focus on concepts and strategies that enhance the students' ability to analyze situations and to form and defend opinions. Whenever possible students should be assigned to sites which allow them to solve actual problems experienced by the practitioner and/or confronting the site.

Student performance should be assessed through examinations and other assessment measures that test the student's ability to critically think and problem solve. These measures should also be used as a form of self-assessment for the student as he or she progresses through the program. When areas for improvement are identified, the student and faculty should collaboratively identify strategies for individual student mastery. The Curriculum Workgroup believes that use of the above-mentioned educational and assessment strategies will facilitate the educating of students who are capable of achieving the educational outcomes as described in this report.

Staffing Levels and Faculty Qualifications

a. Faculty

Effective implementation of the baccalaureate degree program requires adequate faculty and staff resource levels. The changing nature of the healthcare environment, diversity of practice settings, expanding scope of practice and demands for educating a more self-directed learner require that faculty continually adjust and revise the curriculum to meet the needs of the marketplace. Academic programs must be adequately staffed in order to meet the challenges of a dynamic, rapidly changing knowledge base within the profession.

Faculty have an obligation to provide a quality education to students both in the delivery of course content and the discovery of new knowledge for better practice applications. To foster a quality academic program, a minimum of one full-time program director and the equivalent of three full-time faculty members are recommended to adequately staff a baccalaureate degree program. This calculation assumes that faculty,

excluding the program director, are responsible for at least two course preparations per term and that the courses are only offered once a year. Faculty resources for general education and prerequisite courses are not included in this calculation. It also assumes that faculty are allowed time to engage in scholarly activity (research and publication) as well as teaching and community service as part of their faculty workload. In addition, faculty resources may be adjusted depending on the institution's commitment to research, teaching and community service.

Programs may wish to configure faculty resources based on a collaborative matrix design that relies on faculty from other academic units to teach within the program. Given the expanding breadth of the curriculum into such areas as information technology and data literacy, the program may wish to partner with faculty whose teaching expertise is in another discipline, such as epidemiology, management information systems, etc. However, it is recommended that the program director must retain responsibility for assuring that the course content remains relevant to the overall mission of the curriculum. The qualifications of the program director and faculty should ensure that course content is adequately covered by faculty with the appropriate teaching expertise for the content under study.

The program must have a program director who is responsible for overall administrative activities of the program including curriculum design and development. The program director's administrative responsibilities are such that it is recommended that the teaching load for this individual not exceed the equivalent of one (1) three-credit course per semester. The qualifications of the program director should include the following:

- 1) Doctoral degree;
- 2) AHIMA Health Information Administration (HIA) certification;
- 3) Expertise in content areas taught; and,

4) Knowledge of curriculum design and educational strategies.

The program faculty should possess the following qualifications:

- 1) Doctoral degree preferred, or Masters degree;
- 2) Expertise in content areas taught; and,
- 3) Knowledge of curriculum design and educational strategies.

Part-time faculty should have the qualifications appropriate to their teaching assignments and their work should be evaluated systematically and in the same manner as full-time faculty. Part-time faculty must participate in faculty activities, such as advising students, planning curriculum changes and interacting with faculty from other disciplines. Caution should be exercised when using part-time faculty to cover departmental workload. Excessive reliance on part-time faculty to present a curriculum risks excessive fragmentation and lack of coordination.

b. Support Staff

Secretarial support staff equivalent to at least one full-time individual must be provided to the program. In addition, rapid advances in information technology and the use of this technology in the HIM profession may require that academic programs have a dedicated computer laboratory. A laboratory assistant is needed to maintain the integrity of the laboratory's hardware and software configuration. This individual should provide technical assistance to the program faculty and may serve as a teaching assistant to the students if appropriate.

Computer Laboratory

The purpose of the computer laboratory is to 1) provide state-of-the-art training and a technological knowledge base, 2) expose students to a variety of technology and 3) allow students to interact successfully in a technological environment. A laboratory is integral to the work of the students and to their achievement of the knowledge needed for practice. The laboratory must serve as a source of simulation activity for procedures related to the design, use, analysis, coding, presentation, storage and retrieval of health care data in manual or electronic form. A dedicated computer laboratory is recommended to provide consistent and dependable access to information technology. However, with increasing technological advances, there are many alternatives for providing sufficient and dependable computer access. The networked laboratory facilitates teaching activities, software expansion needs and access to a central data repository. The program will need to acquire a number of general and HIM related software applications (i.e., encoders, groupers, cancer databases, master patient index, etc.) that can require significant amounts of CPU and peripheral device capacity.

Laboratory exercises should provide for computer experience in HIM functional areas as well as in many basic computer applications. Exercises should be developed that emphasize the acquisition of skills related to the use of electronic tools to solve problems and make decisions. Students must learn to collect, integrate, analyze, disseminate and translate vast amounts of data into usable information for patient care, financial, legal, administrative, quality management, case management, outcomes research, planning and other purposes.

It is important that the program have a plan for the continuous development and upgrading of the laboratory in order to remain current with technology and applications necessary to educate students for today's and tomorrow's HIM needs. A list of recommended general and HIM related software applications are found in Figures 6 and 7 respectively. Students must have access to such software in order to successfully compete in the marketplace.

Figure 6: Examples of Basic Educational Software Applications

<u>Applications</u>	<u>Vendors</u>	<u>Example of Use</u>
Word processing	WordPerfect MicroSoft Word*	Reports, papers, etc. Forms design, transcription
Medical speller	Stedman's Medical Dictionary	
Databases	Dbase Paradox MicroSoft Access	MPI and other databases Abstracting
Spreadsheet	Lotus for Windows QuattroPro MicroSoft Excel	Budgets Statistics
Graphics	QuattroPro Lotus Harvard Graphics	Quality improvement reporting Statistics Data presentations
Flowcharts, etc.	Visio AllClear	Quality improvement tools Flow charts, diagrams
Other applications	Department layout programs Calendar/scheduling E-mail Internet MicroSoft Visual Basic MicroSoft Project S/Designer Case Tool	Floor plans, work flow Personal time management Correspond with faculty, others Access information Programming language Project management Data modeling

*Programming suites such as MicroSoft Office may be useful (Word, Access, Excel, PowerPoint, Visual Basic, Mail)

Figure 7: Examples of HIM Educational Software Applications

<u>Applications *</u>	<u>Vendors</u>	<u>Example of Use</u>
Encoder	3M Coding Software CodeMaster Coders Bookshelf Medicus	Coding exercises Coding from records Verification of coding exercises Compare & contrast multiple systems
Coding Instruction	EduCode (MC Strategies) Coding Tutor	Computer-aided instruction
Groupers	3M CodeMaster Medicus	Sequencing of diagnoses DRG assignment Optimization Case mix exercises
Terminology	EduCode	Computer-aided instruction
Chart Abstractor	3M	Abstract and retrieve data Format/generate/evaluate reports/indices Compile & analyze statistics
Chart Completion	SoftMed 3M	Deficiency analysis, report generation Physician Notification Analyze & evaluate process
Chart Tracking	SoftMed	Generate reports, track data
Tumor Registry	CansurNet Oncolog SoftMed	Abstract/retrieve/generate reports Requires \$500 training course
Correspondence		Release of information exercises, reports
Birth Certificates	Certificate Manager	Data collection exercises

* The above applications do not have to be purchased from a vendor. They can be designed in-house using general software. Students may receive practice using software at clinical sites.

An example of the hardware and software needs for configuring a dedicated network laboratory to serve 20 students is found in Appendix C. The cost for the hardware and software represents 1995 dollars with academic discounts included. The list is provided as an indication of the potential cost for establishing a computer laboratory. Brand names are included for comparison purposes *only*. There are many alternative products on the market. However, hardware should be purchased that can accommodate the technical requirements of software. Programs are encouraged to seek academic discounts when purchasing both hardware and software applications to help defray costs. Leasing may also be an option.

Core Curriculum and Multiskilling in Allied Health

In the last five years the Pew Health Professions Commission and the National Commission on Allied Health have engaged in a number of studies which have addressed the issue of the future of allied health manpower in healthcare delivery.^{21,22} Both groups have noted the continuing explosion of medical and health information and the resulting need for improved information management to support quality care and evaluation. These groups have emphasized the need for allied health practitioners to apply research skills in outcomes assessment and to be supported by information systems. The model health information administration curriculum presented here supports the healthcare delivery systems' need for skilled practitioners in data administration and information management. Additionally, components of the curriculum can be used by other disciplines to develop or enhance their students' information management skills. Health information administration faculty should be prepared to provide expertise and support to other allied health disciplines' faculties in developing requisite information technology skills.

Recently, conferences related to core curriculum development and multiskilling of allied health professionals have taken place to discuss ways of better preparing allied health professionals for the rapidly changing, more generalist-oriented healthcare environment of the future. A suggested list of core curriculum has been identified by the Pew Commission as follows:

- Medical Terminology
 - Ethics
 - Medical/legal Aspects
 - Basic Computer Skills
 - Healthcare Delivery
 - Pathology
 - Anatomy and Physiology
-
- Basic Emergency Care and Cardiopulmonary Resuscitation
 - Patient Assessment and Examination
 - Patient Education
 - Patient Care Skills
 - Diagnostics
 - Universal Precautions

A comparison of the above core curriculum with the recommended curricular content for the baccalaureate degree health information administrator reveals that at least the first seven of the core curriculum areas are found in the recommended curricular content. In fact this curricular content has been required in health information administration programs for over ten years.

In regard to multiskilling, the Workgroup believes that the suggested curricular content lends itself to multiskilling opportunities for health information administrators. If warranted by the program's community of interest, students could acquire additional course content in diagnostic or therapeutic skills if necessary. However, the Workgroup advocates instead that the multiskilling of health information administration students occur in roles that

are primarily information management-related including quality/performance improvement, utilization management, risk management, confidentiality and information security. The Curriculum Workgroup cautions faculty not to add multiskilling competencies at the sacrifice of the formal health information administration professional curriculum. Faculty should follow an educational process that assists students in becoming self-directed learners who are capable of acquiring additional skill if their jobs so demand after graduation.

Conclusion

Rapid changes within the healthcare environment coupled with changing organizational cultures and practice applications in the HIM profession require that health information administration programs design curriculum that can prepare graduates for a future of technological innovations and change. The model curriculum put forth in this document is designed to serve as a guide to existing and future academic programs that must develop, revise and/or evaluate curriculum to meet the needs of an information-intensive society. The model discusses the course content that should be offered to students, the strategies necessary to deliver the content and the resources that should be available to successfully operate an academic program of this kind. The curriculum model is dynamic in nature and will serve to provide direction in designing curricula, revising essentials and developing certification examinations to meet the challenges of today and the 21st century in health information management.

Glossary of Terms

Case-based learning - an educational strategy designed to emphasize problem solving and decision making skills.

Competency level - extent of abilities that should be developed in students.

Computer literacy - understanding of, and ability to use software applications as related to computer technology.

Data - factual information used as a basis for reasoning, discussion, and calculation.

Data literacy - ability to understand data and its symbolic representation, interpret or give meaning to data and take action as a result of this understanding.

Data modeling - process of modeling and formalizing data requirements with a conceptual modeling tool (i.e., entity relationship (ER) diagram).

Educational outcome - the behaviors, attitudes, attributes expected from students that follow as a result or consequence of the educational process.

Enterprise - unit of economic organization or activity, i.e., business organization.

Entry-level - term used to refer to students who are entering the profession after having successfully completed a course of study from either an associate degree level or baccalaureate degree level program in health information management.

Extra-enterprise - denotes activities that range outside the organization or enterprise entity.

General education - courses which students are required to complete outside of their professional major which foster the skills necessary to function as a responsible adult and contributing member of society

Healthcare information infrastructure - the underlying framework or foundation of information systems within healthcare.

Health information administrator - an individual who has graduated from a baccalaureate degree program in health information management and who performs tasks related to the management of health information and the systems used to collect, store, retrieve, disseminate and communicate that information regardless of the physical medium in which the information is maintained.

Health information management - A continuum of practice concerned with health related information and the management of systems to collect, store, process, retrieve, analyze, disseminate and communicate information related to research, planning, provision, and evaluation of healthcare services; also refers to professional curricula at the associate, baccalaureate and graduate degree levels.

Health information technician - an individual who has graduated from an associate degree program in health information management and who performs tasks related to the use, analysis, presentation, abstracting, coding, storage and retrieval of healthcare data in manual or electronic form.

Information - meaningful aggregation of data or knowledge which can be evaluated for a specific use or set of uses.

Information literacy - ability to recognize when information is needed and have the ability to locate, evaluate and use information effectively when appropriate.

Information services broker - an individual who acts as an agent or intermediary between a client and an information product or group of services.

Knowledge cluster - a broad domain of practice.

Knowledge unit - detailed content area within a cluster.

Medical linguistics - study of the units, nature, and structure of medical language.

Problem-based learning - teaching-learning strategy designed to emphasize problem solving and self-directed study skills, stresses what knowledge students learn and how that knowledge is acquired. Uses group process where students are confronted with a problem, they engage in independent study by investigating various aspects of problem, then come together along with a facilitator to share and discuss with others and receive feedback, ask additional questions, etc., until problem is solved.

Professional education - courses students are required to complete to develop specialized knowledge and skills in a chosen field.

Resource-based learning - learning which results from using multiple resources.

Self-directed learning - students are in charge of own learning and move at their own pace to acquire knowledge from multiple resources.

Transcurricular content - content taught throughout the curriculum to achieve educational outcomes such as critical-thinking, problem-solving, communication skills, etc.

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Appendix A
Outcomes Considered Important by Educators
in Eight Undergraduate Professional Fields

1.	<p>Communication Competence</p> <p>Comment:</p>	<p>The graduate can read, write, speak and listen and use these processes effectively to acquire, develop, and convey ideas and information.</p> <p>Reading, writing, speaking and listening are skills essential to professional practice and to continued professional growth as well as to informed citizenry and continued personal growth.</p>
2.	<p>Critical Thinking</p> <p>Comment:</p>	<p>The graduate examines issues rationally, logically and coherently.</p> <p>Although critical thinking is a universally desired educational outcome, professionals particularly need a repertoire of thinking strategies that will enable them to acquire, evaluate and synthesize information and knowledge. Since much professional practice is problematical, students need to develop analytical skills to make decisions in both familiar and unfamiliar circumstances.</p>
3.	<p>Contextual Competence</p> <p>Comment:</p>	<p>The graduate has an understanding of the societal context (environment) in which the profession is practiced.</p> <p>The capability to adopt multiple perspectives allows the graduate to comprehend the complex interdependence between the professional and society. An enlarged understanding of the world and the ability to make judgments in light of historical, social, economic, scientific and political realities is demanded of the professional as well as the citizen.</p>
4.	<p>Aesthetic Sensibility</p> <p>Comment:</p>	<p>The graduate will have an enhanced aesthetic awareness of arts and human behavior for both personal enrichment and application in enhancement of the profession.</p> <p>Sensitivity to relationships among the arts, the natural environment and human concerns epitomizes aesthetic awareness. Through learning to approach life as an aesthetic experience and by viewing work as an act of aesthetic judgment, professionals can more effectively assess and understand the world and their roles within it.</p>
5.	<p>Professional Identity</p> <p>Comment:</p>	<p>The graduate acknowledges and is concerned for improving the knowledge, skills and values of the profession.</p> <p>Professional identity both parallels and supplements the liberal education goals of developing a sense of personal identity. The sense of personal worth and self-confidence that develops from experiencing success in professional practice, often includes a contributing or altruistic relationship with clients. is an effective vehicle for gaining a sense of one's place in the world as an individual</p>

6.	<p>Professional Ethics</p> <p>Comment:</p>	<p>and citizen.</p> <p>The graduate understands and accepts the ethics of the profession as standards that guide professional behavior.</p> <p>Liberally educated individuals are expected to have developed value systems and ethical standards that guide their behavior. Since in every field professionals face choice and responsibility in the process of making decisions with full understanding of their consequences, the study of ethics provides a context for development of professional ethics.</p> <p style="text-align: right;">continuation.....</p>
7.	<p>Adaptive Competence</p> <p>Comment:</p>	<p>The graduate anticipates, adapts to, and promotes changes important to the profession's societal purpose and the professional's role.</p> <p>A liberally educated person has an enhanced capacity to adapt to and anticipate changes in society. Since professional practice is not static, adaptability can be fostered by promoting the need to detect and respond to changes and make innovations in professional practice.</p>
8.	<p>Leadership Capacity</p> <p>Comment:</p>	<p>The graduate exhibits the capacity to contribute as a productive member of the profession and to assume leadership roles as appropriate in the profession and society.</p> <p>All education carries with it the responsibility of developing leadership capacity. This is particularly true for professional education where the problem-decision-action cycle may have broad environmental, social and individual ramifications. Not only does leadership imply both functional and status obligations, it requires the intelligent humane application of knowledge and skills.</p>
9.	<p>Scholarly Concern for Improvement</p> <p>Comment:</p>	<p>The graduate recognizes the need to increase knowledge and advance the profession through systematic, cumulative research on problems of theory and practice.</p> <p>The heart of the intellectual process is attention to a spirit of inquiry, critical analysis or logical thinking. Although many critical analysis skills are developed as theory and practice are integrated, the professional curriculum can be specifically designed to foster among graduates an obligation to participate in inquiry, research and improvement of the profession.</p> <p>The graduate continues to explore and expand personal, civic and professional knowledge and skills throughout a lifetime.</p>
10.	<p>Motivation Continued Learning</p> <p>Comment:</p>	<p>A truly educated person will wish to continue learning throughout life. In professional education, substantial emphasis can be placed on fostering individual responsibility for continued professional growth.</p>

Appendix B

Guide for Developing Information Problem Solving Skills

"Ultimately, information literate people are those who have learned how to learn. They know how to learn because they know how knowledge is organized, how to find information, and how to use information in such a way that others can learn from them. They are people prepared for lifelong learning, because they can always find the information needed for any task or decision at hand." American Library Association Presidential Committee on Information Literacy

INTRODUCTION

The ability to access and use information is necessary for success in school, work and personal life. The following steps represent the basic elements in an information literacy curriculum.

I. DEFINING THE NEED FOR INFORMATION

The first step in the information problem solving process is to recognize that an information need exists and to define that need. The student will be able to:

- A. Recognize different uses of information (i.e. occupational, intellectual, recreational)
- B. Place the information needed within a frame of reference (who, what, when, where, how, why)
- C. Relate the information needed to prior knowledge
- D. Formulate the information problem using a variety of questioning skills (i.e. yes/no, open ended).

II. INITIATING THE SEARCH STRATEGY

Once the information problem has been formulated, the student must understand that a plan for searching has to be developed. The student will be able to:

- A. Determine what information is needed, often through a series of sub-questions
- B. Brainstorm ideas and recognize a variety of visual ways to organize ideas to visualize relationships among them (i.e. webbing, outlining, listing)
- C. Select and use a visual organizer appropriate to subject
- D. List key words, concepts, subject headings, descriptors
- E. Explain the importance of using more than one source of information
- F. Identify potential sources of information
- G. Identify the criteria for evaluating possible sources (i.e. timeliness, format, appropriateness).

III. LOCATING THE RESOURCES

At the onset of a search a student will recognize the importance of locating information from a variety of sources and accessing specific information found within an individual resource. The student will be able to:

- A. Locate print, audiovisual, and computerized resources using appropriate catalogs and other bibliographic tools

- B. Locate information through on-line databases, interlibrary loan, telephone and facsimile technology
- C. Identify and use community information agencies (i.e. public and academic libraries, government offices) to locate additional resources
- D. Use people as sources of information through interviews, surveys and letters of inquiry
- E. Consult with others to assist in identifying sources of information
- F. Access specific information within resources by using internal organizers (i.e. indexes, tables of contents, cross references) and electronic search strategies (i.e. keywords, Boolean logic).

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IV. ASSESSING AND COMPREHENDING THE INFORMATION

Once potentially useful information has been located, the student uses a screening process to determine the usefulness of the information. The student will be able to:

- A. Skim and scan for major ideas and keywords to identify relevant information
- B. Differentiate between primary and secondary sources
- C. Determine the authoritativeness, currentness and reliability of the information
- D. Differentiate among fact, opinion, propaganda, point of view, and bias
- E. Recognize errors in logic
- F. Recognize omissions, if any, in information
- G. Classify, group or label the information
- H. Recognize interrelationships among concepts
- I. Differentiate between cause and effect
- J. Identify points of agreement and disagreement among sources
- K. Select information in formats most appropriate to the student's individual learning style
- L. Revise and redefine the information problem if necessary.

V. INTERPRETING THE INFORMATION

Following an assessment of the information, the student must use the information to solve the particular information problem. The student will be able to:

- A. Summarize the information in the student's own words; paraphrase or quote important facts and details when necessary for accuracy and clarity
- B. Synthesize newly gathered information with previous information
- C. Organize and analyze information in a new way
- D. Compare information gathered with the original problem and adjust strategies, locate additional information or re-examine information when necessary
- E. Draw conclusions based on the information gathered and the student's interpretation of it.

VI. COMMUNICATING THE INFORMATION

The student must be able to organize and communicate the results of the information problem-solving effort. The student will be able to:

- A. Use the search information to identify the important conclusions or resolutions to the problem to be shared with others

- B. Decide on a purpose (i.e. to inform, persuade, entertain) for communicating the information and identify the intended audience
- C. Choose a format (i.e. written, oral, visual) appropriate for the audience and purpose
- D. Create an original product (i.e. speech, research paper, videotape, drama)
- E. Provide appropriate documentation (i.e. bibliography) and comply with copyright law.

VII. EVALUATING THE PRODUCT AND PROCESS

Evaluation is the ability to determine how well the final product resolved the information problem and if the steps taken to reach the desired outcome were appropriate and efficient. Students may evaluate their own work and/or be evaluated by others (i.e. professors, classmates, practitioners). The student will be able to:

- A. Determine the extent to which the conclusions and project met the defined information need and/or satisfied the assignment (i.e. how well did I do?).
- B. Consider if the research questions/problem, search strategy, resources, or interpretation should have been expanded, revised or otherwise modified (i.e. what could/should I have done differently?).
- C. Re-assess his/her understanding of the process and identify steps which need further understanding, skill development, or practice (i.e. how can I do better in the future?).

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Appendix C: Example of Health Information Management Networked Laboratory Configuration

(To accommodate 20 students per section)

HARDWARE	UNIT PRICE	TOTAL
1 Hewlett Packard NetServer 5/66LF Model 1050 (includes Pentium 66, 1.05 GB HDD, CD-ROM 16 MB Memory, DOS, Mouse and Windows)	3,909.00	3,909.00
1 H-P SureStore 5000i 4 MM DAT Tape Drive	899.00	899.00
1 Champion 16 MB Memory (2x8 MB - 72 pin)	740.00	740.00
1 H-P SVGA Monitor 14"	302.00	302.00
1 H-P EISA Ethernet 10BaseT NIC	213.00	213.00
1 American Power Smart UPS 1250 Watt	604.00	604.00
20 Hewlett Packard Vectra VL3 PC (Pentium 90, 420 MB, IDE HDD, 8 MB Memory, with H-P SVGA 14" monitor; H-P IDE CD-ROM; Champion 8 MB SIMM)	2,712.00	54,240.00
20 Roland Speakers	50.00	1,000.00
20 AST 16 bit sound boards (<i>for terminology</i>)	115.00	2,300.00
20 Radio Shack Head sets (<i>for terminology</i>)	20.00	400.00
20 Network hookups and installation (<i>University</i>)	175.00	3,500.00

1 Sharp LCD full color Computer/Video Projection Panel - IBM compatible (<i>for teaching from a host computer to project for classroom viewing</i>)	5,300.00	5,300.00
1 Hewlett Packard Laserjet 4si mx	3,696.00	3,696.00
1 Hewlett Packard JetDirect network card (<i>to interface with Novell</i>)	369.00	369.00
1 HP Scanjet 2CX Optical Scanner (<i>Color</i>)	955.00	955.00
SOFTWARE		
Novell Netware 3.12 (<i>unit = 25 user pack</i>)	2,384.00	2,384.00
Setup and Software Installation for Network	1,300.00	1,300.00
Powerchute Software (for server)	56.00	56.00
MicroSoft Office Suite (Word, Access, Excel, PowerPoint, Visual Basic, Mail, etc)	865.00	1,730.00
AllClear 3.5 (Windows) (<i>unit = 10 user pack</i>) (<i>flow charts, etc.</i>)	1,253.00	2,506.00
EduCode (coding and terminology) (<i>unit = single copy</i>) License fee renewal (\$ 1,515.00 per year)	260.00	5,200.00
3M CodeFinder, DRG Finder (<i>unit = 5 user pack</i>)	60.00	240.00
Medicus (<i>coding product</i>) (<i>unit = single copy</i>)	50.00	1,000.00
FURNITURE		
20 Computer desks	98.00	1,960.00
20 Drawer modules for desks (<i>single pedestal</i>)	123.00	2,460.00
20 chairs	90.00	<u>1,800.00</u>
	Total	\$92,396.00