

# Information Science and Information-Related Educational Programs: Their Diversity and Accreditation

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Accreditation guidelines were examined for six large information-industry professional societies which are currently defining the scope of their activities by mounting accreditation programs and/or suggesting curricula. Information-related programs in the United States and Canada were identified using *The College Blue Book* (20th ed.). Data analysis classified 94 percent of the information-related educational programs into four areas: science (20%), systems (61%), management (4%), and processing (3%). In 1985, 15 programs awarded the Ph.D. degree, 45 awarded masters degrees, 201 awarded bachelor's degrees, and 70 awarded either associate degrees or certificates. Many programs awarded more than one degree. Review of the *ARIST* volumes showed a wide variety of information science applications and promising developments in theoretical foundations which could guide ASIS in considering accreditation standards.

Information science education has been a topic of periodic discussion at least since the Conferences on Training Science Information Specialists held at Georgia Institute of Technology in 1961 and 1962 [1] and the American Documentation Institute (ADI) Symposium on Education for Information Science in 1965 [2]. The extent of information science and information-related programs continues to be of interest today. Therefore, we have surveyed the diversity of Information Science and information-related programs in the United States and Canada.

Historically, there has also been a concern about professional society influence on framing curricula. In the first volume of the *Annual Review of Information Science and Technology (ARIST)*, Taylor recommended that professional societies become involved in providing such a framework for the information sciences [3]. We have, therefore, also looked at various professional societies now involved in recommending curricula and accrediting information-related programs.

The American Society for Information Science (ASIS) suggests that for "Information for Educational Programs" [4] the student should look at 1) *The College Blue Book* [5], 2) "Graduate Library School Programs Accredited by the American Library Association" [6], and 3) the Association for Computing Machinery "Administrative Directory of University and College Computer Science Data Processing Programs and Computer Facilities" [7]. We have, accordingly, examined the *College Blue Book* for information-related programs in the United States and Canada. These programs award degrees ranging from a certificate to a Ph.D. We have also examined the list of graduate programs accredited by the American Library Association (ALA), the schools accredited by the Computing Sciences Accreditation Board (CSAB), the information-related programs accredited by the American Assembly of Collegiate Schools of Business (AACSB), and noted the accreditation discussions of the Association of Records Managers and Administrators, Inc. (ARMA) and the Data Processing Management Association (DPMA). For perspective, we have looked in *ARIST* for reviews reflecting 1) education for the profession and 2) fundamental concepts of Information Science, as distinguished from applications and practice.

## **College Blue Book**

The 20th edition of the *College Blue Book* was examined to determine information-related educational programs among the 3300 institutions of higher education it lists in the United States and Canada. The *Blue Book* is a comprehensive source listing program titles for certificate/associate, bachelors, masters, and doctoral programs. The word *information* was found in 286 program titles by searching under the following access terms: communication, computer, information, law, legal, library, management, medical, and records.

Almost all the program titles were retrieved under the terms computer, information, and management. There

were two programs under "Library and Information . . .", and one program entitled "Library, Media & Information Services". The terms "medical" and "records" retrieved one program each, and were, therefore, dropped from data analysis. The terms "communication", "law", and "legal" yielded no information-related programs. The program titles were divided into four apparent approaches to information-related education: science, systems, processing, and management. Two hundred sixty-eight (268) program titles (94% of the titles retrieved) could be classified using these categories. These program approaches are shown in Table 1 and Figure 1. The figure shows how the number of bachelors programs (201) dominates all information-related program areas. A proportionately higher number of bachelors programs occurs in the management area than in any of the other areas. By far the largest number of certificate and associate degree programs occurs in the processing area. These programs may indicate a level of vocationally-oriented technical training in information processing. However, a significant number of certificate and associate degree programs also occur in each of the other program areas. While masters degrees are awarded only in the science and systems areas, the masters degree is awarded four times more often in the science area than in the systems area. Not surprisingly, the science area also predominates in the number of doctoral degrees awarded.

## ALA Accredited Programs

The ALA accreditation list of Graduate Library Education Programs [6] gives a total of 60 schools, 45 of which have library-and-information in their school or program names. Only three (3) have *information* without the word *library* in their names. The program titles emphasize science, service, and studies. The areas which these program titles emphasize differ from the areas which the *College Blue Book* information-related program titles emphasize: science, systems, management, and processing. Table 2 shows the masters degrees awarded by these schools. Various library degrees (MLS, MALS, MAL, etc.) are awarded by 57% of the 60 schools. Another 22% of the 60 schools award library and information degrees (MLIS, MSLIS, MALIS, etc.). Seventeen (17) schools award the undesigned MA or the MS degree. Of these 17 schools, only one program has *information*, but not *library* in its program title.

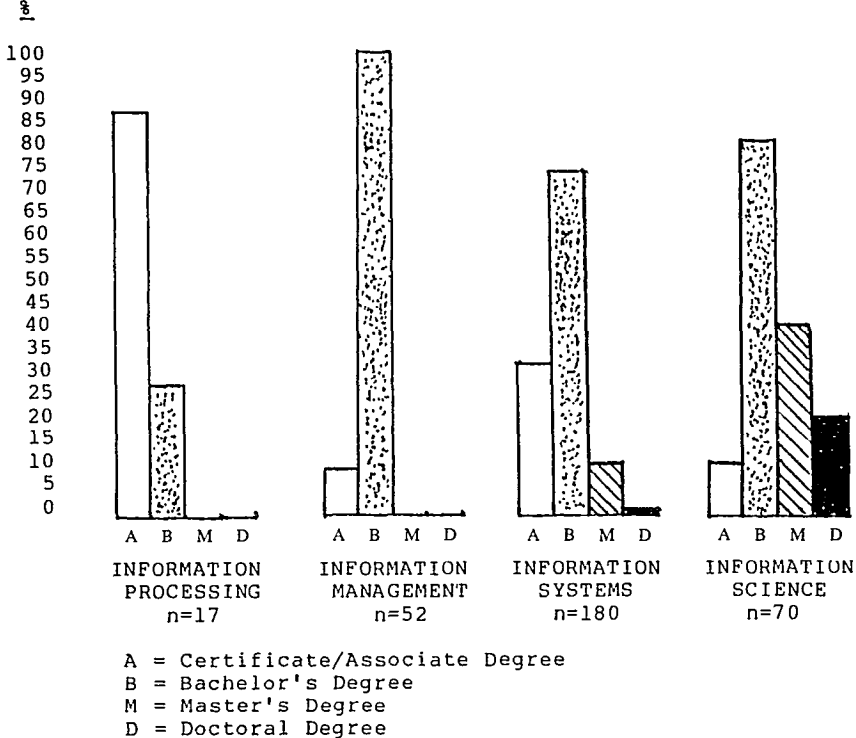
The number of schools using both library and information in their titles has increased to 45 of 60 (75%) over the 37 of 68 (54% in 1983) found by Voos [8]. The rise in the addition of *information* to *library* in program titles has leveled off from the doubling every five years which Voos observed from 1960 to 1983. His 1983 observations show 54.4 percent of program titles with both terms. In 1987, 75 percent of program titles have both terms in their name.

TABLE 1. Information-related program areas: a comparison of their associated degrees.

Areas	Total No. of Programs	Type of Programs			
		Certificate/ Associate	Bachelors	Masters	Doctorate
<b>Information Science</b>					
Information Science	18	1	13	9	5
Information & Computer Science	10	2	8	5	4
Computer & Information Science	42	4	35	13	5
Totals	70	7	56	27	14
% of Total Programs		10%	80%	39%	20 %
<b>Information Systems</b>					
Information Systems & Variants	56	15	38	3	1
Computer & Information Systems	90	39	66	4	0
Management & Information Systems	34	2	28	11	0
Totals	180	56	132	18	1
% of Total Programs		31%	73%	10%	0.6%
<b>Information Management</b>					
Information Management & Variants	8	1	8	0	0
Computer & Information Management	1	0	1	0	0
Management Information	2	0	2	0	0
Totals	11	1	11	0	0
% of Total Programs		9%	100%	0%	0 %
<b>Information Processing</b>					
Information Processing	5	4	1	0	0
Computer & Information Processing	2	2	1	0	0
Totals	7	6	2	0	0
% of Total Programs		86%	29%	0%	0 %
Total—All Areas	268	70	201	45	15
% of Total, All Areas		26%	75%	17%	6 %

Note: Many schools award more than one degree in a program area. Therefore, the sum of the rows '% of Total Programs' will always be greater than 100%.

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Note: Many schools award more than one degree in each program area. Therefore, the sum of the percentages in each program area will always be greater than 100%. As program areas range from a practical-vocational information processing orientation to a conceptual-research information science orientation, the percentage of masters and doctoral programs increases.

FIG. 1. Information-related program areas: a comparison of their associated degrees

The number of schools with *information* alone in their program titles has increased from 1.5 to 5 percent. The number of schools with library, but not information, in their program titles has declined from 41.1 percent in 1983 to 20 percent in 1987. Voos raises the question of whether these name changes reflect "true change or just old wine in new bottles." He suggests that catalogs be examined to determine change. However, the list of ALA-accredited programs suggests that "true change" may be an illusion since

78 percent of the ALA accredited schools offer library or library and information masters degrees, rather than the undesignated MA or MS.

### Accredited Computing Sciences and Data Processing Programs

In 1984, the Institute of Electrical and Electronic Engineers, Inc. (IEEE) and the Association for Computing

TABLE 2. Masters degrees awarded by ALA-accredited graduate programs.

Program Titles	No.	Type of Program		
		Library Masters	Library & Information Masters	Undesignated MA or MS
Library Only	12	10	—	2
Library and Information	45	22	13	14*
Information Only	3	2	—	1
	60	34	13	17

\*Florida State University awards the MS and the MA degrees; the University of Kentucky, Emory University, and Texas Woman's University award library degrees and the MA degree.

Machinery (ACM) jointly published the Computing Sciences Accreditation Board, Inc. (CSAB). Members of a joint ACM/IEEE Computer Society task force developed accreditation criteria to evaluate undergraduate programs by establishing minimum standards that all graduates from accredited programs must satisfy.

"These criteria must be flexible enough to accommodate a range of educational approaches, while ensuring that . . . each student would have a balanced broad-based education and a solid foundation in the basic concepts and practices necessary to enter the computer field." [9, p. 376]

By June 1987, the CSAB had accredited 48 computer science programs in 47 colleges and universities. The CSAB is

"considering accreditation of other computing programs: in particular in the information-systems area [10]. Discussions have been held among representatives from DPMA (Data Processing Management Association) . . . about the possibility of accreditation criteria for information systems programs, but these discussions appear to still be in their early stages [11]. Also, CSAB has had discussions and made presentations to a number of other groups about its activities and possible extensions of its accreditation activities to other computing areas. CSAB will continue to be happy to interact with appropriate professional societies and other groups wherever CSAB assistance might be deemed helpful." [9, p. 383]

### Accredited Business Information Programs

Tasi, Richards, and Zant [12] surveyed information systems programs accredited by the American Assembly of Collegiate Schools of Business (AACSB). In the 51 schools (43 accredited) responding to their survey, the following departments housed information systems programs:

	Percent
Information Systems	26.5
Management and Marketing	20.4
Decision Science	14.3
Accounting	12.2
Management Science	12.2

Smaller percentages included quantitative methods; mathematics, and science. The majority of schools conferred business degrees (BBA, BSB, MBA). MA and MS degrees were each conferred by two schools; the Ph.D. degree was conferred by 13 schools.

### ARMA's Accreditation Program

The Association of Records Managers and Administrators, Inc. (ARMA) has an accreditation program and recommended curricula in draft form. ARMA proposes to accredit records management programs at the associate, bachelor, and masters degree levels. The association has

drafted syllabi for four courses: micrographics, archives management, forms management, and principles of records management [13].

### ARIST's Approach to Information Science Education

One would expect that the accreditation criteria of the six large information-industry professional associations would emphasize the particular interests and focus of their association: the American Library Association (ALA), the IEEE Computer Society, the Data Processing Management Association (DPMA), The American Assembly of Collegiate Schools of Business (AACSB), and The Association of Records Managers and Administrators (ARMA). To determine the distinct emphasis of Information Science as defined by its namesake society ASIS, volumes 1-22 of the *Annual Review of Information Science and Technology (ARIST)* were analyzed for their perspectives on information science education and for their description of fundamental concepts. One is entitled to assume that the annual review of a discipline published on behalf of its professional society (ASIS) will reflect the discipline's basic concepts as well as other interests of the society and of its individual and institutional members.

In introducing *ARIST*, Cuadra wrote: "One need only look at current educational programs in "information science" to find eloquent testimony to the problems of defining the field of interest" [14]. He goes on to list some approaches. Our data show that this problem of defining the field of interest is equally true today. We can respond to Taylor's review [3] that there has been a great deal of development in applications during the past 21 years, but probably less so in fundamental concepts. Following Taylor's suggestion, several professional societies are defining the subject by their accreditation programs and suggested curricula. ASIS, to date, has not. It remains to be determined to what extent Harmon's recommendations for curriculum have been implemented [15]. A new review of education for information science is long overdue in *ARIST*. The last such chapter was published in 1976 [15]. A review entitled "Education for Online Systems" was published in 1979 [16].

There have been signs over the past 10 years that fundamental concepts are emerging to support a theoretical foundation for information science. For example, in 1979 Wyllis stated that systems theory applies to systems analysis, but that most current practice in systems design was still empirical [17]. In 1987, though, relational database theory is increasingly employed in systems design. Zunde and Gehl reviewed core research problems and the search for empirical laws and theories [18]. Although they concluded that most 'laws' are hypotheses or have limited applicability, we believe that writing about empirical foundations of information science and identifying some of them is an important step. McGill and Huitfeldt reported "concern with the development of new formalisms and fundamental theories" in reviewing experimental tech-

iques of information science [19]. Bookstein has suggested that a general model from both probability and fuzzy set approaches may be on the horizon for information retrieval [20]. Narin and Moll reviewed bibliometrics [21] which Boyce and Kraft found, along with information theory, closest to theoretical science. Boyce and Kraft reviewed broadly accepted evaluative measures of retrieval performance [22]. Dervin and Nilan noted "a quantum revolutionary conceptual leap" in the area of information needs and uses since 1978 [23]. Finally, in 1987, statistical methods in information science were reviewed by Kinnucan, Nelson, and Allen [24].

The information science educator today faces a bewildering array of applications and applications areas. However, these applications should be taught in the context of fundamental concepts and principles indicative of a theoretical science. It is hoped that the information scientists with doctoral degrees will emphasize these fundamentals as they teach their students and/or work in the field with less well-educated practitioners.

## Conclusions and Recommendations

We have examined the diversity of information-related programs and looked at various professional societies involved in accrediting these programs. The number of information science, information systems, and other information-related programs is greatest, by far, at the bachelor's level. Two-year associate degree programs are not uncommon. Graduate programs occur more often in information science and information systems than in other information-related program areas. The number of professional societies accrediting academic programs at all levels in information-related areas is increasing. These societies also provide curricular standards and, in some cases, recommend course syllabi.

We are not prepared to delimit information science education for the purposes of accreditation. However, given the perspective of the diversity of programs we have examined and the continuing development of theoretical concepts in the field, we are prepared to recommend what information science education should *not* be:

- It should not be subsumed by any one discipline, mission, or industry; that is, it should not orient itself or limit itself to specific applications or to any one application area.
- It should not train practitioners just for today's market. It should provide skills for today and also principles for tomorrow.
- It should not be technology bound. Technological innovation and change are too rapid; technical obsolescence comes too soon.

We echo Harmon in calling for ASIS to become involved in accreditation [15]. In the past 11 years, many professional organizations have developed accreditation programs to provide educational standards which promote their own program focus. ASIS at least should develop recommendations for program content. By recommending

curricular content for education in information science, ASIS will have to focus on what information science education should be.

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