I would tell them to read one of the bibliometric entertainments to get a general feel for the range of uses to which citation analysis can be put, to skim the pieces on personalities—particularly the one on Derek Price—as general background material for their studies, and to read intensively the three papers on document production (information overload, using page numbers in citing books, and ghostwriting) with a view toward further discussion in class.

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New Directions in Library and Information Science Education. J.-M. GRIFFITHS; D. W. KING. Knowledge Industry Publications, White Plains, NY (1986). 465 pp., $36.00 (ASIS members, $46.00), ISBN 0-86729-159-1.

This document reports the results of a USDE-funded project to identify the competencies needed to perform professional-level library and information work, now and for 10 or more years into the future. The method of the study consisted of (a) identification of competencies through a literature search and interviews with administrators and high-performing information professionals, (b) affirmation ("validation") of those competencies by professional members of the library and information community; and (c) subjective assessment of educational requirements for and implications of the competencies, including implications for the future. The project relied heavily on an advisory group of 17 eminent information professionals who gave direction and reaction to the project staff and staff products.

The project result was a list of over 8,000 competencies that were sorted into type of competency (knowledge, skill, attitude), type of information work setting (public library, academic library, data base producer, archive/museum/collection, etc.; type of information function (reference, acquisitions, exhibit management, marketing, customer support, etc.), and level (entry, midlevel, and senior-level). Competencies were also clustered into those that are common across all work settings and all functions, across all *library* settings and functions, across all *nonlibrary* settings and functions, across all functions within each work setting; and across all work settings for each function. The project report, proper, concludes with a statement of recommendations for formal education, training, continuing education, career development and planning, and "new directions for the future."

The report's major recommendations are as follows:

1. Education and training specific to the job setting (i.e., regarding the organization or the technology of the workplace) must be the responsibility of the employer.
2. Students should specialize by function rather than work setting, since the study demonstrated the generic nature of many competencies across settings.
3. Selected skills, in addition to knowledges or attitudes, should be taught in professional education programs.
4. Generic competencies, including some attitudes, should be taught in professional education programs.
5. In their professional education, students must learn the need for lifelong learning—especially for maintaining technical and subject currency and for preparing for career movement.
6. There needs to be more recruiting of quality students, especially in science and technology.
7. The way student competencies are assessed should be reviewed by the profession.

The most valuable pieces of the document consist of the "issue papers" and several literature reviews prepared as background for the study. Examples of these are pieces on the definition of competencies; relationships between education, competencies, and performance; competency-based education; methods of competency identification, validation, and assessment; and competency identification through task analysis.

Less valuable are the project results and recommendations themselves. The lists of competencies provide a massive base of data from which library and information science educators and managers might begin to identify the competencies to which they could or should respond as they write job descriptions, perform task analyses, or prepare curricula. (The competencies for the reference function alone span 9 pages; related activities and output measures are another 11 pages. And 22 other functions are addressed in this study!). However, given the limitation of the project's methods, they must be considered preliminary checklists at best. The recommendations, inasmuch as they

seem to be largely without empirical base and are at best loosely referenced to the findings, are of uncertain value. In contrast to the relatively broad base of opinion used to generate and validate the lists of competencies, the recommendations reflect the opinion of a small group of information professionals (the project staff and, perhaps, the advisory group and a few others). Many of the recommendations seem nonsequiturs to the findings reported and out of place in the report.

Regarding method, while we might desire a more objective base for the establishment of competencies, given the limits of time and resources, it is difficult to argue with the essentially literature-based and opinion-based methods that yielded the lists of competencies. Similarly, one would have desired an even broader base of opinion ("validation"). However, appreciating the massive amounts of time required for those who responded to the validation questionnaire, one can accept the low return rate (about 28%), even though it resulted in too few data to validate competencies in certain work settings or functions. Such limitations may be acceptable because this is a first effort and, as the report claims, it was as much a project to establish a process for ongoing identification of competencies as it was a project to establish competencies themselves.

However, this document manifests two limitations that should have been avoided and that depreciate the project: conceptualization and reporting.

Conceptual limitations. When exploring the possible futures of a given field, it is essential that one scout the perimeters well. There, on the fringe of established activity, is where the external environment shows its impact on the established field and where, as a result, some of the most dramatic innovations can be found. The primary conceptual limitation of the New Directions project and its report is that it explores mainly the established regions of library and information science, with an occasional glance at the peripheries. Even though the report frequently espouses a broader approach, it gradually becomes apparent that the project has concentrated on information professionals and competencies as encompassed by programs now found in ALA-accredited schools. There are nods in the direction of such peripheral areas as data base production, publishing, and archives, but it appears that the overwhelming focus is on competencies that fall within the purview of established schools of library and information science. An indication of this bias is reflected in the makeup of the advisory group: 13 out of 16 carry titles and organizational affiliations that indicate library/information science establishment. Another indication is that alternative (fringe) means of addressing competencies — such as information science programs in schools of management or computer science and undergraduate programs of information management, information studies, library science, and information science — are barely mentioned or are dismissed as falling outside the scope of the study.

Throughout the document there seems to be an uncertainty of what the field consists of. Although the field is defined in several places, as one sees the broad term *information professionals* replaced with *library and information professionals* and, in one spot, *library and other information professionals*, one comes to sense a strong library bias in the work. The sense is reinforced when *library experience* is used (by mistake, we hope) to mean something broader, such as *information work experience*. The report claims a broad view, but affords either a narrow or an inconsistent one. If one seeks a broad and futuristic construction of the information field, this document will disappoint. The view is more of our familiar professional navel than of the information field's frontiers.

When it deals with certain basic knowledge, skills, and attitudes, such as numeracy, communication skills, and feelings about others, the report ignores the critical contribution of experiences prior to professional education in the development of competent professionals. Curiously, the study does not attempt to identify those competencies that might be considered unique to the field, either empirically through the validation questionnaire, or conjecturally following data collection. What results are several lists of competencies, many of which apply equally well to other professional work, to nonprofessional work, and to just plain living. Statement of such universal competencies contributes nothing to definition of this field.

The report as report. The issue papers and background papers scattered through the document are, generally, adequately presented. Their internal organization is good and they are written reasonably well. The report of the study itself, however, is muddled. There are occasional lapses in grammar and, more important, irregularities in the use of terms such as those referring to the information field. The writing is often disintegrated, imprecise, and undisciplined. It often meanders.

The report of the study proper is poorly organized. It mixes background, rationales, methodologies, results, conclusions, and gratuitous comments in a way that obscures the thrust of the study. The reader is often uncertain as to what study decisions have been made. Diversions are thrown up here and there (such as issue papers, which are inserted in chapter 3). There are needless repetitions of conceptual and methodological matter (for example, information processing functions). There are no samples of the data collection instruments. Information important to establish one's understanding of the project is sometimes buried deep in the document. (For instance, the operational definition of competencies is on page 123; the best description of what is included or excluded as "informa-

tion professional" is on pages 161–167.) The document reads like independently written chunks bound together.

This project represents a start in an important area, although not an auspicious one. A particular process of establishing competencies has been demonstrated, but its conceptual limitations and an inadequate report forestalled a successful demonstration. I doubt that the process will or should be repeated, as the authors have proposed from the beginning.

There is much work yet to be done if the field, as it should be defined for the end of this century, is to discover the full range of its requisite competencies and address them appropriately.

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INDEXIT: A Microcomputer Indexing Program and Manual. A. D. Pratt. Graham Conley Press, New Haven, CT (1985). 56 pp. + disk, $49.95, ISBN 0-912087-01-3.

The proposed purpose of this program is to index a body of textual material that has already been printed, as, for example, when one is working from page proofs of a new book, or from an already-published book that lacks an index. What INDEXIT does, in fact, is not the actual indexing, but the ordering of index entries into correct sequence.

Key parts are a data-entry function, called ADD, and a merge function. The ADD function allows the user to type in the index entries, print them, revise them, and delete or add more until the index is completed. The MERGE function, which is fully automatic, sorts the newly created entries into alphabetical order and interfiles them with whatever entries have been previously made. In the REFORM function, index entries are automatically reformatted and a new file is created that brings together all the references to a single subject and puts the page numbers in ascending order. The indexer working from publisher's proofs can thus proceed page by page through the text, adding index entries as they occur on each page, and merging the entries with a previously accumulated set of entries, to produce a single alphabetical list of index terms and corresponding page numbers.

Entries can be filed letter by letter or word by word, and certain characters in alphabetization can be ignored if desired. Cross-references can be added in addition to the index entries. A capability for generating multiple sequences allows the user to create more than one alphabetical index at a time; for example, an author and a subject index. The printed results can be used as a working draft, and further changes can be made by using one's own word processing program.

System requirements are an IBM PC with at least 128K RAM; double density, double-sided disk drives; a PC DOS version 1.1, 2.0, or higher (works successfully with MS DOS); a monochrome screen; a standard keyboard; an 80-column monitor; and a word-processing program capable of handling "ordinary files of text." (INDEXIT creates standard ASCII serial files.) The program can also be used with a hard disk drive.

The manual consists of 56 pages, including an introduction and brief overview, two chapters on the basic use of INDEXIT, a chapter on "advanced" uses (e.g., adding cross-references and indexer's notes), limitations and error recovery, a description of system operation, and instructions on making copies. An introduction to indexing gives basic guidelines for the novice indexer, and principles applicable to both machine-aided and manually produced indexes. A carefully selected brief bibliography lists the standard texts for indexing.

The manual is clearly presented and could be used with an elementary command of the PC or MS DOS operating system. The example given to illustrate the use of the basic commands works well and allows one to execute the system without major difficulties. Menus, prompts, and error messages work reasonably well.

A minor limitation is that the maximum size of the index file will be one half the capacity of a disk. (INDEXIT checks to see that the size is not exceeded). Thus, the index can only be about 4,000 to 5,000 entries long. This should not be a major consideration in most instances. A second limitation is that users will need a program disk and a data disk for each different index, because different indexes cannot be put on the same set of disks. Third, because the printed index draft will appear as a single column, users requiring double columns for camera-ready copy will need a word processing program that will easily generate a double column format.

A more serious limitation to some will be the fact that, as mentioned earlier, INDEXIT does not generate the list of index entries but, rather, assists in the entry, alphabetization, and merging