Education for Knowledge Organization:
The Indian Scene

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SUMMARY. This paper briefly traces the history of library education in India and examines the status of bibliographic organization and control in the country as a major factor influencing the nature and content of courses in knowledge organization. The two basic documents from the University Grants Commission–the first one issued in 1965 and the recent one in 2001–that have influenced university-level course contents are examined. Finally, the nature of changes that are being brought about in recent years in some universities are highlighted.

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BACKGROUND

India attained political independence in 1947. Modern western-type university education may be said to have begun in the country with the establishment of the three premier Universities of Bombay, Calcutta and Madras in 1857. Formal training programs for library personnel, however, date back only to 1911 and are closely linked to the introduction of free public library service in the country. William Borden, an American librarian, was invited by the then Maharaja of Baroda in 1911 to organize public library service in the princely state of Baroda. Borden started a training program to train the required personnel. In 1915, the Punjab University, Lahore (now in Pakistan), started a training program in librarianship. It was, however, S. R. Ranganathan's appointment in 1924, as librarian of the University of Madras, that triggered far-reaching developments and changes in training for library professionals in the country. Ranganathan founded the Madras Library Association in 1928 and, under its auspices, started a summer training program. This program was taken over by the University of Madras in 1931 and was upgraded into a full-time post-graduate (Graduate) Diploma program in 1937–indeed, the first such program on the Indian subcontinent! Five other universities introduced similar programs during the pre-independence period, viz., Andhra University (1935), Banaras Hindu University (1941), University of Bombay (1943), University of Calcutta (1945) and University of Delhi (1947). S. R. Ranganathan was directly associated with the programs at Banaras and Delhi. It was also during this period that some of the seminal works of Ranganathan–including those expounding his new theories in classification and cataloguing–appeared. These two factors–the direct association of S. R. Ranganathan, and the publication of some of his seminal works that earned 'Library Science' the status of an academic discipline–have both influenced and shaped the content and emphasis of educational programs in the country. The creation of the University Grants Commission (U.G.C.) in 1953 by an act of Parliament provided fillip to higher education in general. The U.G.C., in its schema of things, attached considerable importance to the role of university libraries in higher education and research and, as a necessary consequence of this, sought to improve university education and training for library professionals. The U.G.C. constituted a committee under the chairmanship of S. R. Ranganathan and the 1965 report of the committee, *Library Science in Indian Universities*, has had a signifi-

cant impact on course contents in practically all of the universities in India (University Grants Commission, 1965).

BIBLIOGRAPHIC ORGANIZATION

The situation which exists in a country with respect to bibliographic organization and control will necessarily have a bearing and impact on the educational programs in the area. In examining the educational programs and course contents for bibliographic organization in India, therefore, it is important to keep in mind the several factors that have possibly had a bearing on these:

- Unlike the more developed countries, India has not seen the emergence of any major centralized cataloguing service at the national level, even to this day. This has meant that libraries have always been and continue to be expected to do original cataloguing of almost their entire acquisitions. Of course, to a significant extent, this has been influenced by the fact that a large proportion of the acquisition of university and research libraries is of foreign origin. These factors have resulted in a situation in which there has not been much uniformity in classification and cataloguing practices among even the major libraries. Even the creation of bibliographic records in the languages and scripts of the item being catalogued is also, comparatively, a recent phenomenon. In a way, all of these have prevented the development and acceptance of national standards in the form of cataloguing codes, lists of subject headings, schemes of classification, etc. A variety of standards and tools with varying degrees of local modifications are, therefore, found to be in use in libraries in the country.
- Efforts at developing machine-readable bibliographies and OPACs are a comparatively recent phenomenon. It is only in recent months that the *Indian National Bibliography* has begun to be made available in machine-readable form also. The emergence of library networks in metropolitan cities began in the 1990s and probably the most successful of these has been the DELNET (The Delhi Library Network, now called Developing Library Network). Many other projects aimed at networking libraries or at creating machine-readable bibliographies are in various stages of development. Very recently a project aimed at retro-con-

version of bibliographic records in the *Indian National Bibliography* has been initiated.

UNIVERSITY LIBRARY SCHOOLS

Educational programs at the Master's level began with the establishment of the Department of Library Science in the University of Delhi as an associated project of UNESCO in 1947. In an indirect way, the course contents of this program became a model for the whole country. S. R. Ranganathan was invited by Sir Maurice Gwyer, then the Vice-Chancellor of the University of Delhi, to be a professor in the University, and Ranganathan was responsible for starting the Master's program in the University of Delhi. When, more than a decade later, Ranganathan established the Documentation Research & Training Centre (DRTC) in 1962, under the auspices of the Indian Statistical Institute, the same set of courses that were approved for the Master's program in the University of Delhi was adopted with some minor modifications. Subsequently, when the U.G.C. invited Ranganathan to head a committee to prepare a report on *Library Science in Indian Universities*, the committee's recommendations insofar as course contents at the Master's level were concerned, more or less reflected the courses that had been in force in the University of Delhi and at the DRTC. Most universities which introduced Master's programs in the 1960s and 1970s adopted the recommendations made in this report with only, if any, minor modifications. The universities of Bombay and Mysore were probably the only two notable exceptions to this general trend. The course contents recommended by S. R. Ranganathan, as is to be expected, laid considerable emphasis on classification and cataloguing. It should be both interesting and relevant here to have an overview of the course contents as they were at that point of time. Such an overview will also facilitate an assessment of the nature of changes that have since been introduced in the course contents of formal university programs at the Master's level. Table 1 presents an overview of the courses and an outline of their contents as recommended by the U.G.C. Review Committee.

The table clearly indicates the heavy emphasis on classification and cataloguing in the course contents–the two areas accounting for over 50% of the courses. However, in the actual implementation of these courses, there were certain imbalances in that certain aspects of bibliographic organization and control received greater attention and certain

TABLE 1. Courses Recommended by the U.G.C. Review Committee (1965)

Course Title	Broad Course Contents	Weight*
Universe of Knowledge	• Mapping of knowledge in philosophical classifications • Modes of thinking and modes of formation of subjects • Research methods	4 Credits
Depth Classification (Theory)	• General Theory of Classification of S. R. Ranganathan and others; Contributions of C.R.G. and other schools of thought • Comparative study of major schemes of classification	4 Credits
Depth Classification (Practice)	• Classification of micro-subjects using *Colon Classification* and *Universal Decimal Classification* including use of depth schedules/fascicules	4 Credits
Advanced Cataloguing (Theory)	• Theory of cataloguing; Normative principles of S. R. Ranganathan • Comparative study of *Classified Catalogue Code* of S. R. Ranganathan and *ALA Rules/AACR* (choice and form of headings) • Descriptive cataloguing • Subject cataloguing • Rules for filing and alphabetization	4 Credits
Advanced Cataloguing (Practice)	• Cataloguing of books, complex serials (and non-book materials) using *Classified Catalogue Code* supplemented by chain indexing and *ALA Rules/Anglo-American Cataloguing Rules* supplemented by *Sears List of Subject Headings* (preparation of main and added entries as for a dictionary catalogue and for a classified catalogue and filing of these entries)	4 Credits
Bibliography and Literature (Elective)**		4 Credits
Academic/Special Libraries (Elective)**		4 Credits
Projects (Literature Survey, Field Survey, Guided Project)**		4 Credits

*Credit system in university courses was not prevalent at that time; the figures in this column have been arrived at on the basis of the approximate number of hours of contact (lectures/seminars, etc., per week) (1 Credit = 1 hour of teaching per week over a semester spread over roughly 16 weeks or half-hour of teaching per week spread over an entire academic year).
**These courses are not directly relevant to Bibliographic Organization and Control; however, students could, if they so desired, choose a theme from the area for their project work.

other aspects received less than the required emphasis. For example, in the courses on classification, there was greater emphasis on teaching/learning notational devices and the desired level of emphasis on vocabulary (the Verbal Plane) was missing. This certainly was the case at least until the 1970s. Similarly, the courses on cataloguing laid great emphasis on choice and form of headings, resolution of conflict in the choice of the main entry, etc., rather than on descriptive cataloguing. The lack of emphasis on descriptive cataloguing probably had to do with the

fact that, in the scheme of Ranganathan, detailed and elaborate description of bibliographic entities had no place. Even the rules for national bibliographies in his *Classified Catalogue Code* (which certainly require a higher level of description than catalogues of open access libraries) prescribed only a minimal level of description (Ranganathan, 1964).

Winds of Change

Beginning with the mid-1960s, there were major changes and developments in bibliographic organization and control the world over. In cataloguing, the period marked the beginning of the era of MARC, *AACR*, the ISBDs, a revival of the Cataloguing-at-source (under the label, *Cataloging-in-Publication*), and IFLA's Universal Bibliographic Control program. In the area of subject access, the ASLIB-Cranfield studies and other evaluation studies provided a better understanding of the nature of subject indexing languages. There was increasing discussion on enhancing subject access in online catalogues. In India, the period was marked by certain significant developments:

- S. R. Ranganathan published a paper in 1964 on facet analysis, in the *Journal of Documentation*, which marked the beginning of a major shift in the emphasis from notation to using facet analysis as the basis for structuring subject headings. The research triggered by this led to the development, eventually, of Postulate-based Permuted Subject Indexing (POPSI) in India and the Preserved Context Index System (PRECIS) in the U.K.
- Special libraries in India began looking at thesauri as an effective device for providing subject access; it is not without significance that the first national-level seminar on thesauri in India was held only in 1976, more than two decades after the idea was promoted in the U.S.A. Several in-house thesauri in such areas as Energy, Leather Technology, etc., were developed using semi-automatic methods of generating thesauri.

It was also during the 1970s that the University Grants Commission suggested to universities in the country that there be a change from 'library science' to 'library and information science' in the nomenclature of their departments and educational programs. Courses in computers, systems analysis, etc., were introduced as a part of library school curricula, and there were attempts to introduce aspects dealing with the im-

pact and implications of computers in the core areas of library and information science, including cataloguing and information retrieval. However, it was the arrival of the microcomputer in the 1980s and the free distribution, by UNESCO, of CDS/ISIS (software for the creation and management of textual databases) that really made a big difference. Since the advent of microcomputers, commercial library application software packages have also been developed within the country and have become widely available. More recently major library automation funding agencies such as INFLIBNET[1] have made library automation software packages available to institutions coming under their umbrella. All of this is in sharp contrast to the situation that existed in the 1970s and 1980s when the few libraries that chose to automate some of their operations had to develop software in-house. Today a large number of libraries–academic and special libraries–are in varying stages of automating their operations, and almost all of them use commercially available software or software made available by the funding agencies. Compliance with such standards as, e.g., ISO 2709, is now generally taken for granted, which certainly was not the case in early library automation projects implemented during the 1970s and even early 1980s.

The Revised Programs

Considering the major changes taking place in the universe of information and information technology, the University Grants Commission realized the need for taking a fresh look at course contents and also the structure of the program at the Master's level. A Curriculum Development Committee was set up.[2] The report of the CDC in Library & Information Science, however, turned out to be a disappointment and, soon enough, the U.G.C. suggested that this be reviewed. Another committee went into this and, after a series of consultations and workshops, came out with a document entitled *UGC Model Curriculum: Library and Information Science*, which was published by the U.G.C. in 2001 (University Grants Commission, 2001). The U.G.C. even suggested that all universities should update their own course contents to conform to the suggestions made in this document. This document recommended a substantial revision of course contents. Table 2 presents an overview of the recommended courses and contents relevant to bibliographic organization and control.

TABLE 2. Revised Courses Recommended by the U.G.C.

Course Title	Broad Course Contents	Recommended no. of hours of instruction/ study	Overall weight (against a total of 64 credits)
Knowledge Organization, Information Processing and Retrieval (Theory)	1. Universe of Knowledge 2. Bibliographic Description 3. Methods of Knowledge Organization 4. Subject Cataloguing	120	4
Knowledge Organization, Information Processing and Retrieval (Practice)	1. Classification of Documents (usually using *Dewey*, *UDC*, and *Colon*) 2. Book Numbering 3. Cataloguing of simple and complex documents (using a standard cataloguing code–usually *AACR2* and Ranganathan's *C.C.C.*) 4. Subject Cataloguing (using a standard tool–usually *Sears List* or *LCSH* and chain indexing)	120	4
Information Retrieval	1. Subject Indexing: Principles and Practices 2. Indexing Languages and Vocabulary Control 3. Information Retrieval	120	4

THE PRESENT SITUATION

University programs in Library & Information Science are being offered in the country in over 75 universities and other institutions of higher learning. It is difficult, in a review such as this, to examine in detail the course contents of all or even a majority of the schools. What has therefore been attempted in the following paragraphs is to provide an overview of the course contents and to illustrate the nature of changes that are taking place with some examples. At present, there are two distinct models of formal university education for library and information professionals in India and both are graduate programs (post-graduate level).[3] The first model represents a continuation of the scheme that was introduced by S. R. Ranganathan in the University of Delhi in 1948. This model consists of two separate graduate programs:

- A one-year Bachelor's degree program (B. Lib. Sc./B.L.I.Sc.) (intended to train middle-level professionals)

- A one-year Master's degree program after B.L.I.Sc. (M. Lib. Sc./M.L.I.Sc.) (intended to train supervisory and higher-level professionals)

This scheme still remains in operation in several universities although, in recent years, many universities have switched over to an integrated two-year (four semesters) Master's degree program in place of two independent programs. Irrespective of the model any particular university school has adopted, courses on knowledge organization–classification, cataloguing, and subject indexing–form a major component of the core curriculum in all universities without exception. Traditionally Indian universities have divided the courses in this area into "Theory" and "Practice," following the recommendations in the U.G.C. Review Committee report. The contents, almost without exception, include:

- Normative principles and postulates forming the theoretical basis of knowledge organization
- Practical training in the use of select schemes of classification, codes of cataloguing, subject heading lists, and subject indexing procedures
    - The classification schemes taught in detail include: *Colon Classification* and the *Dewey Decimal Classification* (at the Bachelor's degree level), and advanced classification using *Colon Classification* and *Universal Decimal Classification* (at the Master's level). One or two schools had the practice of teaching *L.C. Classification* as well; it is not certain whether the practice is still being continued.
    - Cataloguing codes taught include the *Anglo-American Cataloging Rules* and the *Classified Catalogue Code* (*CCC*) of S. R. Ranganathan. The convention in most schools is to teach the use of *AACR* for the preparation of a dictionary catalogue, and invariably, the *Sears List of Subject Headings* is used as the tool for formulating subject headings. The use of *CCC* in the preparation of a classified catalogue is practiced, with chain indexing as the principal tool for preparing the subject index to the classified catalogue. Even at the Master's level, generally the same two codes are taught with emphasis on cataloguing complex serials, non-book materials, etc. In recent years, some schools have begun offering electives in the cataloguing of non-book materials, and the core courses are restricted to the application of cataloguing codes and other tools for the cataloguing of books and periodicals.

- There are wide variations in the teaching of applications of other tools and techniques such as thesauri, subject-indexing techniques, authority files, etc. However, almost without exception, the application of such techniques as PRECIS and POPSI, and post-coordinate indexing are included in the course contents of most schools. Some schools, especially in the 1960s (e.g., DRTC and the library school at the Banaras Hindu University), would insist on students at the Master's level designing a depth version of *Colon Classification* for a micro-subject as a mandatory requirement. This no longer forms a part of the core curriculum today. Design of micro-thesaurus/classaurus are, however, chosen by some students for their project work, which is a mandatory requirement at the Master's level in many schools.

- There are also variations in the teaching of cataloguing for the machine environment. Almost without exception, MARC formats form a part of the core curriculum. A significant development during the past decade and more is the effort in practically every university school to integrate information technology components into the core courses in knowledge organization. For example, in many universities cataloguing is no longer being taught merely to train students to work in a manual environment (say, for a card catalogue). Course contents have been revised to train students in the use of MARC formats such as CCF, US MARC, etc., along with a standard catalogue code. However, most library schools cannot afford commercially available software that can fully support the MARC family of formats. Given this, most schools train students in the use of software packages in the public domain, such as WINISIS. Following INFLIBNET's initiatives, many universities have adopted the SOUL software (Software for University Libraries), the US MARC format, the *Anglo-American Cataloging Rules2*, and the *LCSH* in their plans to computerize their catalogues and other operations. A demo version of this software has been made available to many library schools.

- Digital library research and development in India is a very recent development. However, in the last few years there have been some major initiatives in this area. Following these developments, elective courses in the area of digital libraries, e-publishing, etc., have been introduced in some universities. Course contents have been expanded to include aspects of metadata, and such standards as Dublin Core now form a part of the course contents in some schools. The recently revised course contents of the M. Sc. pro-

gram of the University of Madras reflect the nature of changes that are taking place:
- Knowledge Organization and Metadata (4 credits)
  - Information Entities and Organization of Information
  - Tools for Knowledge Organization
  - Standards for Bibliographic Databases
  - Organization of Digital Resources, Metadata
- Classification Practicum using recent editions of *Colon*, *Dewey*, and *UDC* (3 credits)
- Cataloguing and Document Description (3 credits)
  - Elements of Description–ISBD (G) Practicum using *AACR2*, *Sears List*, and US MARC format/CCF
- Information Storage and Retrieval (3 credits)
  - Subject Indexing Models; Vocabulary; Search Process
- Information Systems Design (3 credits)
  - Practicum in the use of WINISIS (or some other software) along with US MARC or CCF to create (bibliographic and other textual) databases; search and retrieval
  - Practicum in the use of select retrieval packages such as ProQuest, WINSPIRS, etc.

These courses account for 16 credits out of a total of 54 credits in the core curriculum.[4] Besides these courses, an elective course on Cataloguing of Special Materials (3 credits) and elective courses on E-Publishing and on Digital Libraries (each one of which includes a unit on metadata) are also being offered. Many other schools, notably the DRTC (DRTC and NISCAIRS offer an Associateship in Information Science), the University of Mysore (the University of Mysore offers a Master of Information Management Program in addition to the Master's degree programme in Library & Information Science), the National Centre for Science Information (the NCSI offers an advanced post-Master's program in information and knowledge management), Karnataka University, the North-Eastern Hill University (NEHU), and the University of Delhi have carried out substantial revisions of their course contents in recent years.

The School Faculty

The library school faculty in India probably represents the weakest link in the chain of formal and continuing education programs. Faculty strength in many schools is certainly not adequate to meet specialized

training requirements in the area of knowledge organization. The result is that probably no school has any faculty member who specializes exclusively in knowledge organization. This has meant that members of the faculty necessarily have to specialize and teach courses in two or more areas. Those who are engaged in teaching courses in knowledge organization are not necessarily those who have earned their doctorates in the same area. However, every school has one or two faculty members who are equipped to teach courses in knowledge organization.

CONTINUING EDUCATION

It is a truism that only a negligible proportion of the total expenditure on education is spent on continuing education. Universities and institutions of higher education in India do not generally have any statutory responsibility for providing continuing education programs. In recent years, however, with rapid all-around developments and the consequent rapid rate of obsolescence of the skills and knowledge of professionals, there is increasing recognition of the need for and importance of continuing education programs. A large number of organizations are now, as a part of their regular activities, engaged in the conduct of training programs aimed at improving and enhancing the skills of professionals. The principal categories of institutions that have engaged in the conduct of such continuing education programs in recent years include:

- Universities and institutions of higher learning:
  - The University Grants Commission has funded the establishment of a centre known as Academic Staff College (in several universities) charged with the responsibility of conducting continuing education programs for faculty in universities and colleges.[5]
  - Several university departments of library & information science, NISCAIRS (formerly, INSDOC), and the Documentation Research & Training Centre have also conducted short-duration training programs in areas including knowledge organization.
- Professional bodies and associations (e.g., The Indian Library Association, Indian Association of Special Libraries and Information Centres, the Society for Information Science, and even professional associations at the state level). In recent years the annual conventions of some of the major professional bodies, and also in-

ternational conferences held in the country, have included tutorials by experts on emerging areas:

- The ICDL (International Conference on Digital Libraries, New Delhi: February 2004) and ICADL (International Conference of Asian Digital Libraries, Bangalore: December 2001) included tutorials on metadata
- The Sarada Ranganathan Endowment for Library Science (founded by S. R. Ranganathan) has been regularly organising short-term training programs in several areas of relevance to the profession including knowledge organization. The emphasis has been on the use of WINISIS/CDS-ISIS for database creation using appropriate standards such as CCF/US MARC, *AACR2*, etc. The Endowment also conducted national level seminars on
  - Classification in the Digital Environment (2001)
  - Cataloguing of Digital Resources (2002)
- National level agencies such as INFLIBNET and the National Centre for Science Information, Bangalore (INFLIBNET, besides conducting tutorials and open training programs for professionals from universities during its annual convention–CALIBER–also conducts on-the-job training for staff working on its project to put into machine-readable form the catalogues of major university libraries). The contents of these programs include relevant areas of *AACR2* and US MARC format, besides the use of SOUL software for creating machine-readable bibliographic records.
- Library networks (The DELNET, especially, has not only been conducting training programs for project staff of its ongoing projects but has regularly been conducting tutorials as part of its annual national level conventions–the NACLIN. Since 1998 every NACLIN has included tutorials on MARC; many have included tutorials on *AACR2* and *LCSH*, and the creation of bibliographic databases in Indian languages and scripts.)
- At the state level also, besides university schools, some other organizations are engaged in continuing education programs. For example, for the Science City–an organization of the government of the State of Tamilnadu as part of its project to network the 30-odd libraries in the Science City area of the city of Chennai–the University of Madras was asked to conduct a series of training programs for librarians in the creation of machine-readable catalogue records. The course contents included *AACR2*, MARC format, *LCSH*, and training in the use of appropriate software.

- The Central Reference Library which is responsible for the *Indian National Bibliography* has instituted a training program for newly graduated library school students in all aspects in the production of the national bibliography
- Large libraries send some of their senior professional staff to attend conferences and seminars

However, a considerable amount of the training that is conducted for library professionals is on-the-job training in the use of specific tools and packages. Such training is generally arranged by the funding agencies that support implementation of automation projects (e.g., INFLIBNET, DELNET, etc.) or by commercial agencies that supply required hardware and/or software.

THE FUTURE

Given the present scenario, what will be the future of education for knowledge organization in India? This is indeed a difficult question to answer. The major factors that will probably shape and influence education in the area will be:

- The standards and tools that are accepted at the national level for creation of bibliographic databases
- The speed with which the national bibliographic agency, other national agencies (especially INFLIBNET), and large research libraries implement automation of catalogs.

Perhaps some of the developments that are taking place elsewhere suggest that there will be a revival of interest in some of the principles, powerful tools, and techniques in knowledge organization that originated in India. For example, the research that has been going on in the application of facet analysis in the Web environment, the interest shown in a re-examination of the fundamental principles and objectives of cataloguing (IFLA's FRBR, and the suggestion that an ICCP (1961)-type conference should be organized which aims at a re-examination of the basic principles in light of the changed circumstances, etc.), the recognition of the need for metadata embedded in digital resources, and the emphasis on adopting standard cataloguing tools for this purpose are all indicators of the emerging trends. It is highly probable that knowledge organization as a discipline will receive the same level of emphasis that

it enjoyed in the early years after the introduction of university-level programs in library science in the country. Only the courses and contents will be packaged differently to suit the emerging digital environment.

NOTES

1. INFLIBNET is an Inter-University Centre of the University Grants Commission set up with the objective of automating and networking libraries in institutions of higher education and research.

2. In fact, the U.G.C. initiated the exercise of reviewing course contents in every discipline including Library & Information Science and, for this purpose, constituted curriculum development committees (CDC) in practically every discipline.

3. Para-professionals are, with a few exceptions, trained via programs conducted at the post-higher secondary school level by polytechnics and some library associations.

4. A student has to complete all of the core courses and obtain a minimum of 72 credits to become eligible for the award of the Master's degree.

5. College librarians and professionals working in university libraries at the level of Assistant Librarian and above are generally given parity with faculty.

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