SOME CONSIDERATIONS ON THE EDUCATION AND TRAINING OF LIBRARIANS AND INFORMATION SPECIALISTS

Mr. President,
Ladies and Gentlemen,
Dear Colleagues and Friends,

It is my great honour to address this distinguished audience in which many eminent representatives of the highly respected community of Indian librarians and information specialists are present. You all have a deep knowledge of the basic trends in library and information science (LIS) and many of you are well aware of the problems of education and training (ET) of LIS in India, especially the problems of curricula development for the library and information professions.

What I intend to do here is to present to you some views and findings arrived at as the result of a long experience in information system design and management on the one hand, and teaching LIS in various environments on the other. With this background, I have recently carried out a detailed comparative study of LIS curricula from several countries in order to work out proposals for the revision and reorganization of LIS ET in Hungary. Many of my findings and proposals are of a general nature and may be valid for the ET of LI personnel in other countries as well.

1. SOME MAJOR DEVELOPMENTS IN MODERN LIS AND PRACTICE

The following is a highly selective and very sketchy enumeration of the major developments; it does not pretend to be an exhaustive historical survey of the advent of modern LIS and practice. Its aim is rather to emphasize some aspects of the recent history of our professions which may closely affect the curricula for ET of LI personnel.

1.1 Emergence of modern librarianship

"Librarianship, in the sense of collecting and caring for books, has been practised for many centuries, but only within the last hundred years has it begun to take on the characteristics of a profession" [1]. Modern librarianship emerged during the last quarter of the 19th century as a consequence of the rapid development of the library movement, the increase of library holdings and the number of libraries, the growing demand of library services. The foundation of modern librarianship is attributed to M. Dewey, who is considered not only the author of the famous decimal classification...
system for libraries, but also the father of modern professional librarianship.

By the end of the last century, the basic technology of librarianship had already been elaborated by Dewey and other eminent librarians, and a large spectrum of rules, methods and tools were already available for the use of the profession.

1.2 Emergence of the information profession

The rapid development of science and technology during the last century resulted in the development of the division of labour in research and development (R and D). Two Belgian scholars, P. Otlet and H. La Fontaine, worked out in Europe the foundations of the theory and practice of documentation and information. The needs of society and the methods and tools elaborated by Otlet and La Fontaine resulted in the emergence of a new profession: the information profession, the representatives of which are called information scientists, information specialists, information officers, information managers, information resource managers, etc. The variety of these names reflects the internal division of labour within the information profession.

Though elaborated and founded as early as in the last decade of the 19th century, documentation and information gained ground only gradually. The ideas and methods invented by Otlet, La Fontaine and others not only led to the emergence of an independent profession, but affected very closely the library profession; they also influenced its methods and thinking. "Information science, then, is not antithetical to librarianship; on the contrary, the two are natural allies, and librarians should not reject this new intellectual relative, nor should the information scientist discredit the librarian"[2].

Since the 50's of this century, the notion of "documentation" is covered in the Anglo-Saxon world by the term "information". In France, the term "documentation" has been retained to denote the activities of the information profession. A clever compromise was found in the two Germanies during the 60's by combining the two expressions and using "documentation and information" as a composite term to denote the profession. In the USSR and some other countries, the term "informatics", coined by Prof. Mikhailov [3], is widely used for documentation and information.

1.3 Emergence of LI education

The emergence of the LI professions generated the need for ET professionals. The origins of modern library ET can be traced in the USA to the last quarter of the last century [1]. Basic characteristics of this first stage of systematic ET were its pragmatism and practicism. Library ET in Europe was based rather on a historical and sociological approach.

Systematic and organized ET in IS is a relatively recent development of the last decades. ET of information specialists is organized and offered either independently or in conjunction with ET of librarians.

1.4 Emergence of theoretical investigations

Modern LI practice and the growing need for well trained professionals very soon required not only the elaboration of practical rules, methods and guidelines which explain how to work, but obviously generated the need for investigations into the theoretical aspects of LI work. It is still a controversial issue whether the theory of librarianship or information should be regarded as a scientific discipline (LIS), or as merely a conglomerate of practical rules and methods, and their application [1, especially p. 64-65]. The late Prof. Dr. Ranganathan was one of those renowned librarians who contributed substantially through their theoretical investigations to the recognition of LIS as a scientific discipline.

1.5 Extension of the types of document handled

As one important consequence of the emergence of documentation, librarianship gradually took note of the fact that there are various types of printed, written or otherwise established documents which have to be handled by the profession for the benefit of the users, in addition to the traditional types, such as books and periodicals.
A similar development was linked to the individual handling of micro-documents, an expression coined by Dr. Ranganathan, that is parts of physical documents, such as journal articles, etc. [4].

1.6 The information explosion

The spectacular development of science and technology, and the social and economic development during the last decades, was partly followed and partly generated by the exponential growth of the mass of documents and information to be handled by the LI professions. The information explosion, also called document explosion, has to be considered both as the result and the cause of the research explosion characterized by the exponential growth of R and D activities [5].

The continuous enormous increase in the volume of published and unpublished information sources posed growing difficulties in the handling of the mass of literature for librarians, information specialists and their institutions. It stimulated the publication of secondary information sources, then further types of and methods for consolidation and repackaging of information, and recently the application of modern electronic and reprographic technology to information handling.

1.7 The increasing role of consolidated information

Though abstracting and indexing publications had already been published since the early 19th century, the spectacular increase in their publication and widespread availability is a phenomenon of this century. Abstracting and indexing services helped to control the information explosion in its early stages, survey the growing mass of generated documents and select those from among them which might be useful for specific purposes.

During the last decades, the continuous growth of the volume of generated documents and information could not be fully mastered by traditional abstracting and indexing services. The growing need for analyzed, assessed and evaluated information, presented to the user in a form readily applicable, generated information analysis centres, data centres and other similar types of information processing and disseminating centres which provide various types of consolidated and repackaged information [6].

1.8 Emergence of reprographic technologies

Newly invented reprographic technologies have been gradually applied to LI work. Soon after the first practical application of microforms during the siege of Paris in 1871, the International Institute of Bibliography, the predecessor of the International Federation for Documentation (FID), advocated as early as in 1905, the application of the microfilm to LI work. Since then, handling and use of microforms, offset printing, copying, etc. became current practices in the LI profession.

1.9 Emergence of new information technologies

As a consequence of the second industrial, technical and scientific revolution, modern communication and information technologies have been invented and are still developing. The new technologies, especially electronic technologies, contributed to the revolutionary changes in LIS and practice. This trend started more than hundred years ago, with the invention of the telephone, followed soon by the invention of the typewriter. Later, the establishment of cable and telex communication networks and various types of communication and information technologies were elaborated. Hollerith cards and manual punched cards were introduced into LI work several decades back. Computer applications started in the 50’s-60’s. Automated selective dissemination of information (SDI) originated in the late 50’s. Teleconsulting and teletransmission of documents started in the 60’s and the establishment of machine readable data bases in the 60-70’s [7].

1.10 The changing image of the librarian

This image of the traditional scholar-librarian, which prevailed until the first half of this century, has faded away. It was supplemented by the service-librarian, the library-technologist, the information specialist, whose main function is to serve his user communities. In order to be
able to comply with this task, LI professionals have to acquire exquisite knowledge of LIS and practice; they must possess, in addition, adequate knowledge of the subject fields of interest to the users. The LI professions are thus double-faced professions, requiring professional abilities in LI technology, both traditional and modern on the one hand, and highly qualified subject knowledge on the other, in order to be able to serve and advise users as professional partners.

In view of the growing volume and complexity of the library and information infrastructures, the knowledge of the principles and practice of management and the acquiring of relevant skills also belong to the modern image of the well trained LI professional.

1.11 User orientation

During the last decades, the emphasis of LI work was gradually shifting from the traditional technique orientation and processing orientation towards service orientation or user orientation. In order to provide effective service to users, LI professionals have to study and understand the needs and habits of the actual and potential users. Recognizing that serving the users is the ultima ratio of LIS and practice has gained ground gradually, but by far not completely. The trend towards user orientation emphasizes the service aspect of LI work to the detriment of processing and other technical activities.

1.12 Emergence of information systems and networks

The rapidly growing flow of information and documentation resulted in a higher level division of labour among LI institutions. Systematic cooperation of libraries and information centres has led to the emergence of local, subnational, national and international information systems and networks, not necessarily using highly sophisticated physical-technical communication tools and channels. Information systems and networks help to integrate individual efforts of libraries and information centres, organize resource sharing, improve services — in short: raise the quality and efficiency of LI work.

2 THE SYSTEM APPROACH TO LIS

Though the history of libraries is covering several hundreds, and even thousands, of years, organized library education started only about 100 years ago. In the first stage, ET of librarians was dominated by subjects related to the storage and processing of the holdings. The rather quickly developed core curriculum centred on cataloguing and classification, supplemented by curricula elements on acquisition, readers service, bibliography, later on the history of libraries and the book.

In course of time, this core curriculum was extended by including subjects concerning the social relations of libraries on the one hand, and library administration and management on the other. During the last decades, the handling of non-book materials was also added in general to the curricula.

ET of librarians had to face from the beginning the same enormous problem which is intriguing the library profession itself: the librarian's vocation is to handle physically and technically documents, the contents of which he is bound to know well if he wants to be able to fulfil the service requirements of the library. In order to comply with this two-folded task and responsibility, specialization and differentiation within the library profession started already in the last century according to library functions on the one hand, and types of libraries on the other. This trend of differentiation did not yield the expected results; ET of librarians suffered from the lack of a systematic theoretical foundation of librarianship [1, 9].

As opposed to the largely pragmatic approach in USA, ET in Europe expected to base itself on historical disciplines for building up an adequate theory of librarianship. This trend is still prevailing in various European countries, especially in Central and Eastern Europe.

A third possible way is presented by the conceptual approach of Dr. Ranganathan who tried to elaborate the foundations of librarianship based upon his well known Five Laws of Library Science [8].

In spite of all these attempts and the efforts of many eminent library and information scientists, the theoretical foundations of libr-
EDUCATION AND TRAINING OF LIBRARIANS AND INFORMATION SPECIALISTS

Librarianship and information work have not yet been worked out in a manner which could be acknowledged universally. Various scientific and professional circles still hold that library and information science cannot be recognized as a scientific discipline.

The general theory of systems [10] provides another approach to the theoretical foundations of LI and practice. The system approach studies the library as a sophisticated, complex information system consisting of interrelated subsystems. Every library is an open system which is closely interrelated with its social environment and is continuously communicating with the environment through various interfaces [11].

As the result of a similar argumentation, every information centre or any specific type of an information centre (information analysis centre, data centre, etc.) can also be considered an open system, the basic structure of which is analogous to that of the system mentioned above with respect to libraries.

The basic model of the information system does not depend upon the specific characteristics of the institution which collects, stores, processes and disseminates information. The structural isomorphism of the model allows its being applied to any type of library or information centre.

A common attribute of the open system is its exchange of matter, energy and information with its environment. In the case of open information systems, the following four main interfaces serve to establish contacts with the environment:

- The input interface for the input of acquisitions and the inflow of other types of information from the environment, affecting the behaviour of the system;
- The user interface for the output of information, that is, the information services. This interface is permeable for the counterflow of information from the user to the system in the form of feedback;
- The interface for the input of material and financial resources necessary for the functioning of the system;
- The interface for the inflow (and outflow) of human resources (manpower).

What is the significance of the system approach in its application to libraries and information centres? The structural isomorphism of the information systems modelling both libraries and information centres and the logical homology of these systems provide the philosophical background for the analogous handling of libraries and information centres. ET of LI personnel can be developed on a common basis, justifying the establishment of a common core of subjects which should be included in the curricula for both the professions.

3 MAIN CONTENTS REQUIREMENTS OF THE CURRICULA FOR LIS

3.1 General

Starting from the general scheme of the information system, we can deduct the main contents requirements of ET, the main groups of subjects which must be represented in the core curriculum. From practical considerations, these main subject groups do not correspond exactly to the four main interfaces described in Section 2. First of all, one of the subject groups refers to the internal structure and subsystems of the system. In addition, the acquisition function has been amalgamated with the description of the subsystems of the system.

The core curriculum, with which we deal in the following, covers knowledge of the foundations, theory and practice of librarianship and information work in the narrower sense. ET in subject specialization in any branch of science, technology, social and human sciences, or other practical knowledge, is not the subject of this address. Another important subject omitted is instruction in foreign languages. Knowledge of foreign languages is indispensable for every librarian and information specialist who is expected to render full service to his or her users. But this is another story!

Librarians and information specialists have to know very well the elements of the information system, the functioning of its subsystems and their interlinks. They must be aware of the interrelations of the system with
its social environment and of the complex
color character of these interrelations. Last not the
least, they must know how to plan, organize
and manage an information system. Systematiz-
ing the core curriculum elements, we may
establish four main subject groups which form
the core curriculum for ET of librarians and
information specialists.

The structure of the curriculum presented
provides general guidelines for curricula plan-
ing, and, in addition, a conceptual framework
for the comparative analysis of LIS curricula.

3.2 The main subject groups of the core
curriculum

3.21 The social function and role of libraries;
and information centres
- The notion and concept of information. Its
social function and role;
- The place of the information system in
society, in the social process of know-
ledge generation, communication and ab-
sorption;
- Origin and historical development of the
forms, elements, tools, role and functions of
libraries and information centres;
- Information policy. Its role and share in
development policy; in science and techno-
ology, economic and social policy; in scienti-
fic-technical and socio-economic planning;
- Interrelations with the related fields of
publishing, printing, the book trade, ar-
chives, etc.;
- Economics of information and information
systems; information as a commodity;
marketing of information.

The links to society through the user inter-
face might well belong to this subject group
as well. In view of the paramount importance
of the user interface, it seems to be more ad-

3.2? Information use, information users
- Analysis of the objective demand and the
subjective needs of information, that is,
analysis of the evident, apparent demand
and the latent demand;
- Analysis of the structure of user groups;
- Analysis of information demand and needs
in various social settings. Information for
R and D, problem-solving, decision-making,
top management and other management
levels;
- Analysis of information and reading habits;
- Analysis of information use;
- Feedback. Its role and forms. Feedback as
a control mechanism and management aid;
- Psychology, pedagogy and sociology of
information use and reading.

3.23 System components and their functions.
Methods and processes
- Analysis and systematization of information
sources;
- Acquisition;
- Processing. Cataloguing, classification. Ab-
stracting, indexing, consolidating, repackag-
ing of information. Analysis, assessment,
evaluation of information;
- Translation;
- Library and information services;
- Information technology, both traditional
and modern. Applications of computer,
telecommunication and reprographic tech-
nologies.

3.24 Information system design and manage-
ment
- System theory. Morphology and classifica-
tion of systems;
- Methodology of system analysis, design,
engineering and management;
- Flow of materials, financial and human
resources;
- Work studies, work performance and capa-
city,
EDUCATION AND TRAINING OF LIBRARIANS AND INFORMATION SPECIALISTS

- Work organization;
- Standardization (local, national, international);
- Efficiency, effectiveness, financing, accounting;
- Technical and economic evaluation of the system;
- Planning, control, management;
- Local, national and international information systems, their interrelations. System cooperation.

4. RESULTS OF COMPARATIVE ANALYSIS OF 22 CURRICULA

The study carried out in 1983 covered the curricula of 22 LIS schools and courses from eight countries and one international organization (Unesco) (Annexure 1). The coverage of the study was, most regrettably, limited, because most of the curricula available for comparative study included only lists of subjects and did not contain data about the distribution of the time devoted to the subjects listed. Such curricula can be evaluated only in a very rough manner, according to the presence or absence of subjects, without the possibility to answer the question of the relative share of the included subjects.

Another aspect which limits the validity of the analysis of the curricula structure is, of course, lack of full knowledge of the contents of the subjects enumerated in the curricula. In some cases, detailed information was available about the contents of the course, but in most cases one had to guess in which main subject group the subjects of the curricula should be classified.

Annexure 1 presents the data emanating from the survey, showing the relative share of the four main subject groups in the 22 curricula processed in detail. Annexure 2 shows the range of percentage shares and means in the four subject groups according to library curricula, information curricula and library-information curricula.

A large part of the time is devoted to the subject group of library and information methods, processes and technologies, occupying on the average nearly two-thirds of the total instruction hours. It is interesting to note that the range of the respective hours is varying from 24% to 85%. Even more perplexing is the fact that for library courses, this range extends from 24% to 78% as opposed to the range of 45% to 84% in the case of information courses.

The most surprising finding of the survey is, without any doubt, the extremely low share of the subjects concerning the user interface. This deplorable fact is valid for both library and information courses. While the average time devoted to this subject group does not exceed 3%, there are 7 courses (out of the 22) which do not include any elements of this subject group, for which the maximum share is attained in the case of information and library-information courses.

The social function of libraries and information centres takes up nearly one-fifth of time, on the average, the range being extremely wide (0 to 58%). Library courses fare obviously much better in this subject field than the other courses.

The study of management and its elements is represented on the average with one-seventh of the total hours. Some library courses neglect largely this aspect of education. The maximum share is attained by an information course with 33%.

5. CONCLUSIONS

The analysis of 22 curricula, and the study of other curricula not specifying the amount of time devoted to the subjects taught, leads us to the following conclusions.

5.1 The course contents for the ET of librarians and information specialists is widely divergent in scope and emphasis. It seems that the curricula are not structured in general, according to the prevailing societal needs; they show rather the traditional impact of historical and technical subjects dominating many courses, and additional subjective personal traits of the teaching staff. The course structure seems to preserve its rigidity when observed over time; there is a general lack of dynamism in curricula building.
5.2 Overemphasis on the technical aspects of library and information work can be observed, especially the overrating of traditional library technologies, such as cataloguing and classification.

5.3 Little emphasis can be traced on modern information technology and its application, except in information science courses. Most library courses present technologies of the past, instead of technologies of today and the near future.

5.4 Consolidation and repackaging, assessment and evaluation of information is rarely given the time in the curricula which these important subjects really deserve.

5.5 The poor representation of user studies and related subjects is extremely deplorable. The neglect of the most important aspect of LI work is in striking contradiction to the general trend which reflects the growing social need for user oriented information systems and services.

5.6 Information system design and management is underrepresented in the curricula. The courses do not give, in general, sufficient guidance to librarians, and to a lesser extent to information specialists, in the planning, design, control and management of complex information systems, such as libraries, information centres, data banks, data centres, information analysis centres, etc. and their networks.

5.7 Within the subject group on the social functions of libraries and information centres, library science courses often overemphasize the historical studies (history of libraries, the book, printing, publishing, book trade, binding, illuminating, etc.) and underrate the importance of the social aspects of LI work and the corresponding institutions. The role of libraries and information centres and their staff in the social process of generation, preservation and dissemination of knowledge and information is hardly taught in an adequate manner.

5.8 In the light of recent developments and new trends in LIS, a general review and a detailed evaluation of the existing ET courses and facilities is an absolute necessity for India as well. It is high time to reconcile the actual needs of society and the technical and institutional capabilities available with the contents and structure of the curricula.

5.9 Because of the continuous growth of information needs and the extremely rapid development of information and communication technologies applicable to LI work, a continuous upgrading of the curricula is unavoidable if the LI professions want to synchronize and harmonize the social demand of their services with the practical ability of the professional staff. In order to restore the reputation of the LIS education system, the static pattern of LI curricula has to be superseded by a dynamic pattern.

NOTES AND REFERENCES


2. The quotation can be found in the last paragraph of the following article: Shera J H. Of librarianship, documentation and information science. Unesco Bulletin for Libraries 1968, 22(2), 58-65.


5. For a concise summary of the problems involved in the information explosion see the chapter on


10. The foundations of a general theory of systems has been elaborated by Prof. L. Bertalanffy, a scholar of Hungarian origin. General system theory, New York, G. Braziller, 1968.


16. Programme of the course.


18. Brochure on the programme of the course.


### Annexure 1: Structure of the LIS Training Courses Processed

<table>
<thead>
<tr>
<th>No.</th>
<th>Country</th>
<th>Institution</th>
<th>Duration, years</th>
<th>Course character</th>
<th>Relative share of the four main subject groups in the curricula, %</th>
<th>Inf. source</th>
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<tbody>
<tr>
<td>1</td>
<td>Hungary</td>
<td>Teacher training colleges</td>
<td>3</td>
<td>L</td>
<td>14 8 72 6 [12]</td>
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<td>2</td>
<td></td>
<td>University of Budapest, Dept. of LS</td>
<td>5</td>
<td>L</td>
<td>22 - 78 -</td>
<td>[13]</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>University of Budapest, Department of LS</td>
<td>2</td>
<td>I, P</td>
<td>4 - 83 13</td>
<td>[13]</td>
</tr>
<tr>
<td>4</td>
<td>GDR</td>
<td>Colleges of librarianship, course for sci. librarians</td>
<td>3</td>
<td>L</td>
<td>40 6 47 7 [14]</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>Colleges of librarianship, course for public libraries</td>
<td>3</td>
<td>L</td>
<td>54 6 34 6</td>
<td>[14]</td>
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<tr>
<td>6</td>
<td></td>
<td>Humboldt University, Berlin, Department of LIS</td>
<td>4</td>
<td>L</td>
<td>54 4 24 18</td>
<td>[14]</td>
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<td>7</td>
<td></td>
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<td>2</td>
<td>L, P</td>
<td>58 3 27 12</td>
<td>[14]</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>Colleges of information science</td>
<td>3</td>
<td>I</td>
<td>18 4 45 33</td>
<td>[14]</td>
</tr>
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<td>9</td>
<td></td>
<td></td>
<td>2</td>
<td>I, P</td>
<td>19 7 50 24</td>
<td>[14]</td>
</tr>
<tr>
<td>10</td>
<td>FRG</td>
<td>School of LIS, Baden-Wurttemberg</td>
<td>2</td>
<td>L</td>
<td>19 1 65 15</td>
<td>[15]</td>
</tr>
<tr>
<td>11</td>
<td></td>
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<td>2</td>
<td>LI</td>
<td>17 2 62 19</td>
<td>[15]</td>
</tr>
<tr>
<td>12</td>
<td></td>
<td>School of LIS, Koln/Cologne/</td>
<td>2</td>
<td>L</td>
<td>20 - 71 9</td>
<td>[15]</td>
</tr>
<tr>
<td>13</td>
<td></td>
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<td>2</td>
<td>LI</td>
<td>17 - 72 11</td>
<td>[15]</td>
</tr>
<tr>
<td></td>
<td>Country</td>
<td>Institution</td>
<td>Level</td>
<td>Program</td>
<td>Students</td>
<td>Faculty</td>
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<tr>
<td>14</td>
<td>Austria</td>
<td>National Library and university libraries</td>
<td>2</td>
<td>LI, P</td>
<td>9</td>
<td>4</td>
</tr>
<tr>
<td>15</td>
<td>Belgium</td>
<td>Universite Libre de Bruxelles</td>
<td>2</td>
<td>I, P</td>
<td>-</td>
<td>5</td>
</tr>
<tr>
<td>16</td>
<td>France</td>
<td>Mission interministerielle de l'info. scientifique et technique/MIDIST/Universite des sciences sociales de Grenoble, Universite Claude Bernard de Lyon</td>
<td>1</td>
<td>I, P</td>
<td>9</td>
<td>3</td>
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<tr>
<td>17</td>
<td>&quot;</td>
<td>Institut d'etudes politiques de Paris</td>
<td>1</td>
<td>I, P</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>18</td>
<td>&quot;</td>
<td>Universite Claude Bernard de Lyon. UER de mathematiques, Laboratoire d' informatique</td>
<td>1</td>
<td>I, P</td>
<td>6</td>
<td>-</td>
</tr>
<tr>
<td>19</td>
<td>India</td>
<td>INSDOC</td>
<td>2</td>
<td>I, P</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>20</td>
<td>Senegal</td>
<td>Universite de Dakar. Ecole des bibliothecaires et documentalistes</td>
<td>2</td>
<td>L</td>
<td>6</td>
<td>-</td>
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<tr>
<td>21</td>
<td>&quot;</td>
<td>&quot;</td>
<td>2</td>
<td>I</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>22</td>
<td>Unesco</td>
<td>Plan of a course</td>
<td>1</td>
<td>L, I</td>
<td>10</td>
<td>10</td>
</tr>
</tbody>
</table>

Mean: 18 3 64 25

1/1 = Social aspects; 2 = Information users; 3 = Methods, technology; 4 = Management
2/L = Library course; I = Information course; P = Postgraduate course

1/ Including computer science and applications, reprography
# Annexure 2: Ranges and Arithmetic Means of the Relative Shares of the Main Subject Groups

<table>
<thead>
<tr>
<th>Main subject groups(^1)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>( R^2/ )</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All curricula</td>
<td>0 - 58</td>
<td>18</td>
<td>0 - 10</td>
<td>3</td>
</tr>
<tr>
<td>Library curricula</td>
<td>6 - 58</td>
<td>32</td>
<td>0 - 6</td>
<td>3</td>
</tr>
<tr>
<td>Information curricula</td>
<td>0 - 19</td>
<td>7</td>
<td>0 - 9</td>
<td>3</td>
</tr>
<tr>
<td>Library-information curricula</td>
<td>9 - 17</td>
<td>13</td>
<td>0 - 10</td>
<td>4</td>
</tr>
</tbody>
</table>

\(^1\) 1 = Social aspects; 2 = Information users; 3 = Methods, technology; 4 = Management

\(^2\) \( R = \) Range

\(^3\) \( M = \) Arithmetic mean