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A Study of Israeli Library and Information Science Students' Perceptions of Their Profession

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As the librarian's traditional roles undergo significant changes reflecting the transition from the world of print to the digital world, we focus on Israeli LIS students' responses to these changes. Our study examined the attitudes and perceptions of 180 Israeli students regarding the relationship between librarianship and information science as professions, the roles of librarians and information scientists, potential places of employment for librarians and information scientists, comparative status and prestige of librarians and information scientists and finally, students own individual career preferences. Although most students believed that both professions are related, they attributed higher status and prestige to information science. Information science was also perceived as more highly associated with computer technologies. In general, students aspired to be information scientists. As future representatives of their professions in both private and public work settings, their attitudes and preferences will undoubtedly affect the nature of the profession. The present study is significant in a period of transition as schools of librarianship and information science modify their curricula and cope with the technological innovations impacting the traditional nature of librarianship.

Introduction

The traditional occupation of librarians has undergone numerous changes in the last quarter century, primarily due to technological developments, which include the PC, electronic databases, electronic data retrieval methods and the emergence of the global information network known as the Internet. The assimilation of these tools in librarian work created the need for continuous study and modification of work and administration practices. In addition to changes in libraries, schools of librarianship also have amended their curricula, offered new study tracks and gradually changed the name of the profession from librarianship to information science. The librarian became also known as the information scientist, information professional or information specialist. These were more than merely semantic changes, and reflect a substantial transition in orientation from the organization and use of print materials to an engagement with a multidimensional, boundary-less digital space in which no conventional rules of preservation, organization and reference existed.

These changes in fact symbolize the search for identity of this profession, rooted in both practice and theory, which has recently embraced elements from the world of computers and communications. Schools of librarianship and information science (LIS) all over the world are challenged by difficult questions concerning the future of the profession, its new attributes, the most appropriate training for professional development and the very definition of the profession itself. A process such as this is not exceptional in the world of academics. After many generations in which a conventional set of subjects were taught in universities, such as philosophy, law, medicine, languages and science, many new subjects have

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Figure 1: The Department of Information Science, Bar Ilan University. Israel

emerged on the scene, including business administration, accounting, bio-technology, genetics, as well as socially-oriented subjects such as psychology, criminology and social work. These new subjects underwent a similar process of re-orientation to define and refine their emerging theoretical and practical foundations. In fact, these are still evolving on the basis of recent research publications. In the twentieth century, subjects such as business administration or social work, which, like librarianship, have been identified as practical professions, have gained recognition as academic subjects with a solid theoretical foundation.

In light of the current re-definition and consolidation of LIS studies, one obvious factor affecting the profession's formative development in the future are the graduates who practice the profession in various work settings, in libraries, and in information centres in the private and public sector, and shape their practice on the basis of their job perceptions and expectations. In this cyclic process involving schools of librarianship and information science, students and market forces ultimately shape the profession, which will either gain recognition as the modern substitute for traditional librarianship, or alternatively, evolve as a separate profession existing alongside librarianship. It is therefore appropriate to investigate how students of LIS respond to this change, specifically their perceptions of the profession, their comparative status perceptions of the profession of librarianship and information science and their personal preference of becoming or working as librarians or information scientists. Accordingly, the present study was designed and conducted on a population of Israeli students of Information Science at Bar Ilan University.

The Department of Information Science at Bar Ilan University is the largest department of its kind in Israel. Since the 1990s, the department

has gradually changed its name and the contents of its curricula, as discussed in detail below. According to the department's basic conception of the field, information science is a continuation of librarianship; it is a profession involving the organization, management and processing of knowledge, and the use of advanced technologies. The potential work places are educational institutions such as libraries and community centres, as well as other institutions such as commercial enterprises or hi-tech industry. Despite the department's clear conception of the profession's roles and the potential employment opportunities of its graduates, the following distinction has gradually evolved in the Israeli labour market: The term "librarians" is used for all individuals employed in libraries, and the term "information scientist" is used for individuals working outside library settings. Therefore the students sometimes tend to see the librarian and the information scientist as different professions. This ambivalent situation, we believe, called for an in-depth examination of students' perceptions regarding the nature of their field of studies and their aspiration for future employment.

Literature review

From librarianship to information science

The concept of providing information services has been known for thousands of years. As early as the seventh century BCE, a library existed in Nineveh, while the library in Alexandria of the third century BCE was known as one of the greatest cultural institutions of the world (Hessel 1955; Jackson 1974; Thompson 1977). In ancient times, librarians were graduates of schools for scribes who subsequently underwent internships lasting several years in specific work settings. In the Middle Ages, monks, who were responsible for the preservation of cultural treasures, also copied manuscripts and maintained the libraries in monasteries. Although the invention of the printing press in the 15th century by Johannes Gutenberg increased the assortment of books in private libraries of the nobility as well as in those of religious orders, the librarian's traditional role in organizing and preserving information remained unchanged (Thompson 1977; Jackson 1974; Hessel 1955; Steig 1992; Jenkins & Godow 2000).

The Age of Enlightenment, characterized especially by the transition from a religious to a secular society, significantly contributed to the development of large national and public libraries, as secular institutions where systematic cataloguing was used. Libraries also played an important role in the dissemination of knowledge subsequent to the extension of education, the accelerated process of urbanization and the emerging need for technological education for a growing class of labourers.

In 1876, the American Library Association was formed with the aim of providing for the needs of public libraries all over the US. One of the association's famous founding members, Melvil Dewey, also published the first edition of his "decimal system classification" at that time. Dewey also headed the first school for librarians, which he established in 1887 at Columbia University in the US (Steig 1992; Black 1998; Jenkins & Godow 2000). The institution symbolized the beginning of a transition from random and individual training to a formal, structured and standard professional training program. Over the years, curricula in schools of librarianship underwent major changes, as did the very definition of the profession. By the end of the twentieth century, the following definition of librarianship, which appeared in the American Library Association Glossary in 1983, became accepted:

> "the profession concerned with the application of knowledge of media and those principles, theories, techniques and technologies which contribute to the establishment, preservation, organization and utilization of collections of library materials and dissemination of information through media." (as cited in Steig 1992, 3)

This new definition reflects a broader view of the profession of librarianship, as a process whose true purpose is providing for information needs. This changing perspective of librarianship is sometimes reflected in the use of diverse terminology of the professions definition. In the absence of consensus regarding the definition of the profession, concepts such as "information specialist," "information profession" or "information scientist" are common and are used by different researchers who define the terms based on their own understanding.

These new definitions were influenced considerably by the terminology of a young dis-

cipline known as information science. The first known formal use of this term was in 1958, in England (Ingwersen 1992, 101). One of the classic definitions of the field was suggested in 1968:

> "Information science is that discipline that investigates the properties and behavior of information, the forces that govern the flow and use of information and the techniques both manual and mechanical of processing information for optimum accessibility an usability" (Borko 1968, 3).

Since then, disputes and differences of opinion regarding the nature of the profession have prevailed. Various areas of specialization have developed under the auspices of schools of librarianship, including information management, information retrieval and informatics (also known as bibliometrics). However, this lack of consensus, together with the changing state of the profession, has led to an identity crisis of students regarding the nature of information science and its relationship to librarianship: Is information science a new, independent subject or is it a branch of librarianship (Steig 1992)? Most published papers on information science concerning the future of the profession are unfortunately theoretical and lack an empirical foundation. The following section discusses findings from two experimental studies which were conducted concurrently between 1998 and 2000 in the US and Israel. Although both are grounded in different research methodologies, they reached similar conclusions.

Recent studies

The KALIPER study (Kellogg-ALISE Information Profession Education Renewal Project) was conducted by renowned researchers, with the support of the W.K. Kellogg Research Fund and ALISE, the American Association for Library and Information Science Education (Marshall 2001; Pettigrew 2001; KALIPER Project 2002). Five groups of researchers studied the programmatic structure and changes in 29 schools of information and librarianship in the US in recent decades, using a combination of quantitative and qualitative research methodologies. Surveys, interviews with school directors, content analysis of course material as well as cases studies were used. Researchers concluded that six prominent trends in these schools reflect change and rethinking. These trends were:

1. Courses which train students for work in information settings other than libraries have been added to the classic areas of study which train students for work in libraries. The new courses included information marketing, information management, legal and ethical issues. Consequently, several schools omitted the term "librarianship" and formally adopted "information sciences" as the name of their institutions.
2. Schools have incorporated topics from various research fields, based on recognition of the importance of the inter-disciplinary nature of the field. This process frequently is conducted in collaboration with other departments on the campus. Among the new programs is the study of cognitive and social perspectives of how information systems are created, organized, accessed, used, evaluated and disseminated. One prominent issue is the emphasis on users' needs and profiles.
3. Schools invested considerable economic resources in the acquisition of modern information technologies, the development of computer laboratories and the instruction of new information technologies.
4. Schools expanded the number of specializations offered to their students, to facilitate graduates' entry into the labour market extending beyond libraries. Some institutions offer extremely flexible programs which include numerous electives, while others require students to enrol in introductory courses in the areas in which they plan to work.
5. Schools elaborated their instruction methods to facilitate students' access, including distance learning or accreditation agreements with other schools.
6. Schools have increased the range of degrees awarded in the profession and now offer BA, MA and Ph.D. degrees.

The second study is the Delphi study, which was conducted at Bar Ilan University (Israel), based on assessments of 40 experts, directors of libraries and information centres from the US, Canada, Europe and Israel (Baruchson-Arbib & Bronstein 2000). The majority of the participants concurred that the traditional library model will not be completely supplanted by a virtual model. Although libraries are expected to undergo far-reaching changes, including new patterns and emphases in work, 87.5% of these experts believed that libraries would continue to function as a place for the retention of "social memory." The traditional approach, which focuses on the

organization and management of information, is expected to be replaced by a user-focused approach. Eighty-five percent of the participants in this study felt that it was very important for information scientists to devote considerable resources to understand users' needs, while 73.8% believed that such a process was not merely desirable but feasible. Study findings showed that information professionals have gained an initial awareness of the "unique nature" of their own information skills and are beginning to understand that their competencies in this area may be useful in roles outside libraries. Eighty-seven and a half (87.5) percent of experts expect information science to assume a central role in our information society. They also believe that, today more than ever, information science skills are essential in planning strategic searches, planning and designing information resources, and especially, training teachers to teach information literacy.

The information needs of the market will also undoubtedly affect the nature of the changes in schools of librarianship. As these needs increase, students will find themselves employed beyond the physical boundaries of library buildings (Grover 1997; Dolan & Schumacher 1997). We can expect many types of information items to become completely digital, including statistical data, stock market data and lists. In fact, any information that is immediate, volatile and difficult to retain in print will be stored in electronic format. An increasing number of articles will be published in online journals and we can expect the currently disordered information available on the Internet, to become structured and systemically organized in the next decade through the application of new tools (DeVinney 1994; Mason 1996; Grover 1997; Crosby 2000)

Information professionals will become key actors in the development of technological innovations. They will be compelled to develop sensitivity to diverse cultural environments, and commitment to continuous improvement of skills, search techniques and strategies and familiarity with technological systems. Information professionals will be required to acquire more than a mere understanding of how new information technologies operate, and will find it necessary to know how to make optimal use of these technologies with the aim of transforming information into knowledge. Students who choose information science as a profession will be required to commit to becoming auto-didactic throughout their entire career. Curricula, in turn, must support training of professionals who are able to provide an answer to problems, be creative, flexible, innovative, and have full command of technology. As a result, curricula will be required to convey new approaches and methods, alongside theories and skills (Dysart & Abram 1997; Grover 1997).

Perceived image and status of librarianship and information science

In the exploration of students' perceptions and evaluations of the profession of their choosing, one important aspect of career considerations which warrants discussion is the perceived status and prestige of the profession. The higher the status of the profession, the more it attracts high-achieving students and the more they are awarded higher status in the labour market, creating a cycle which ultimately enhances the status of the entire profession. In light of the essential role of librarianship and information science in the organization and accessibility of information, it is important to explore whether the full significance of the profession is appreciated. Do people recognize that, without this function, information would be inaccessible, education would be inferior and scientific development would be impeded? Although there are many elements comprising an evaluation of a profession, we will limit our discussion here to two of the most prominent – status and prestige.

Status is a sociological concept related to social power and prestige, which is used to explain several social phenomena (Kinig 1971; Feder 1992). According to researchers, there are two types of status:

- Ascribed status – which is the basic type of inherited status. In other words, this is the status ascribed by society to people belonging to socially powerful groups, defined by social symbols including sex, race and genealogy.
- Achieved status – which is status achieved through efforts, competition, knowledge, special skills, etc. This type of status refers to the social position that individuals gain by virtue of their achievements and talents, such as financial success, intelligence, fame, academic success and social popularity. An example of this type of status is status conferred on physicians or professors.

Prestige is the admiration, honour, respect and approval conferred on an individual or group of individuals, in respect of above average performance or qualities. Prestige may also be defined as admiration of someone's knowledge and expertise or admiration towards an individual whose talents are unusually appreciated (Billedi 1990).

As the number of areas of specialization has increased and the actions of individuals have become less known to others, new criteria were needed to define individual status. Thus, a new type of status developed, based primarily on the profession of each individual, and was therefore called "professional status." Professional status is an example of acquired status. When professions became a significant indicator of acquired status, sociologists began to study the meaning of professional status (Powers 1982; Nam & Powers 1983). On one hand, professional status was interpreted as a synonym for prestige conferred on a profession, on the basis of subjective criteria such as influence, job security, interest and challenge. On the other hand, professional status was distinguished from prestige and defined on the basis of objective criteria such as required level of educational attainment and estimated earning ability. The present study adopted a definition of professional status based on the following objective criteria: required educational attainment and estimated future income.

The majority of studies on image and status of librarianship and information science focuses on traditional librarianship and not on information science. Singer (1997) indicates that the following associations are connected to the concept "librarian": concern for books, work in a physical space, usually are women, always are powerless. The associations connected to the concept "information scientist" were as follows: information scientists surf the Internet, are not connected to a physical space, are usually men, are powerful due to their engagement with computers. Historical documents, however, indicate that librarians suffered from a poor image even before the profession became identified with women. Quotes from the nineteenth century portray a situation in which librarians in England were perceived as educated, eccentric, odd and, in general, had a negative image (Slater 1987; Harris & Chan 1988; Billedi 1990; Schuman 1990; Lam 1994).

Researchers and other professionals cite several factors to explain the current lack of prestige ascribed to librarianship. First, the profession of librarianship would usually promote the library rather than the librarian (Schuman, 1990). It is completely different to invite people to come to a certain place, than to invite them to consult with an educated expert and skilled librarian. Second, several researchers claim that the profession's low status is related to the fact that most librarians are women (Harris & Chan 1988). They presume a direct relationship between women's low social status and the status of a profession almost completely occupied by women. These researchers believe that the low professional status of librarianship is not a result of the quality of work librarians perform, but due to the fact that the work is typically performed by women. Support for the argument that traditionally feminine professions suffer from low status is the fact that feminine professions are generally identified as semi-professions based on technical skills, service and knowledge, with short training periods (Goode 1961; Etzioni 1969; Toren 1972; Padan-Eisenstark 1972; Shinar 1975; Izraeli 1982; Vice 1988; Glick 1995; Cejka & Eagly 1999). Some researchers believe that the fact that most librarians are "invisible" and are primarily engaged in work "behind the scenes," contributes to their low status and prestige. Poor perceived service also contributes to the low image of the librarian (Freeman 1996).

Furthermore, studies have shown that the public is ignorant about the functions of the librarian or the educational requirements necessary to fill these functions (Lam 1994). Librarians are perceived as service providers whose work requires no advanced education. Librarians' knowledge is perceived as general knowledge: they are not perceived as experts in information retrieval, processing or gathering. Librarians' contribution to their organizations is typically underestimated. Librarians are perceived as individuals who have few tasks to perform and who receive a salary which is larger than they deserve. In 1991, the International Federation of Library Associations and Institutions (IFLA) conducted a global study on the image and status of librarians. The study included an ongoing review of accessible literature, analysis of existing data and surveys conducted among members of library associations all over

the world. The study found that 82% of the survey respondents were convinced that the profession of librarian suffered from low status (Jackson 2000; Prins 1992). Several researchers have recommended that librarians with high technical skills, who wish to advance in their field, should avoid using the label "librarian." Although they stressed that there was nothing wrong in being a librarian, reality proved that most influential clients shied from availing themselves of the services of a librarian, due to the poor traditional image of librarians (Jackson 2000).

The negative perceptions of the profession of librarianship were also reflected in an additional study in Canada. In 2000, a study was conducted among 2,047 first year students (40% male and 60% female) of a Canadian university. They completed questionnaires on the work roles, future employment options, enrolment criteria, status and entry-level salaries for a list of 12 professions selected especially for the study, including lawyer, computer engineer, journalist, systems analyst, Internet investigator and librarian. The findings of this study indicate that while over 90% of the students believed that the professions of law and computer engineering required an academic degree, 60% believed that librarians require no academic education. In terms of professional prestige and status, students ranked librarian lowest of the twelve occupations, while lawyers and computer engineers received the highest ranking (Harris & Wilkinson 2001).

Various analyses which attempt to focus on the factors underlying professional prestige and status, have suggested three sources of high professional status: economic, authoritative and knowledge. The economic power of librarianship is modest, which is also true for authoritativeness and proximity to sources of power. Researchers note that as long as people engaged in librarianship do not demonstrate an ability to generate economic values or other esteemed values to their clients and financial sponsors, they will be unable to claim entitlement to higher pay and status (Spaulding 1989; Lam 1994; Davies 1996).

Knowledge, in fact, is the primary source of power of the profession of librarianship. In general, professions which require specialization and extensive knowledge, such as the law or medicine, are esteemed. It is therefore surprising that there has been no change in librarians' status despite the increasingly central and essential role of access to information in contemporary society. One partial reason is the public's ignorance regarding the professional and specific knowledge required of librarians to do their job. Another structural characteristic of the profession which limits recognition concerns the fact that the product which librarians provide, i.e. information, is not perceived as exclusively belonging to librarians and libraries. Echoing this ambivalence are frequent voices claiming that librarians will become obsolete as information technologies advance. This view obviously fails to take into consideration librarians' unique skills of locating precise information, familiarity with various reference tools and sophisticated knowledge in data mining and processing.

The present study taps into the attitudes and perceptions of students enrolled in LIS programs regarding the nature and value of the profession. As findings of the present study indicate, future decisions regarding the nature of the profession should take in consideration the views of the new generation of professionals.

Research aims

The unique situation of the profession of librarianship / information science is characterized by a transitional period lacking clear definitions of the nature of the profession or its implementation. This generates confusion and ambiguity among students regarding their own studies and professional future. In such times of transition, there is special significance in analysing the emerging perceptions of students, who will play a central formative role in the nature of the profession in the future.

Research questions

1. How do students perceive the relationship between librarianship and information science? Are they perceived as different or related professions?
2. How do students define the roles of librarians and information scientist? Are there any differences in the roles they ascribe to each?
3. Based on students' perceptions, where do librarians and information scientists work?

4. Which branch of LIS-librarianship or information science is more highly evaluated in terms of prestige and status?
5. Do students prefer to become librarians or information scientists?

Methodology

Population

The population for this study was the students of information sciences in the Information Sciences Department at Bar Ilan University in Israel, the largest department of its kind in the country. Today, five hundred BA, MA and PhD students are enrolled in the department, which changed its curriculum and its name from "Bibliography and Librarianship" to "Information Studies and Librarianship" in the 1990s. At that time, various courses in information technology were also added to the curriculum, including a unique field of specialty – "social information sciences" (Baruchson-Arbib 1996, Baruchson–Arbib 2000). In the late 1990s, the curriculum was modified once again and the information technology track was expanded to include knowledge management. The department has since been known as the Department of Information Science, although new technologies have been integrated into a significant proportion of traditional librarianship courses and topics (See http:// www.is.biu.ac.il).

Sample

180 subjects were selected randomly from the department register of students. Of these, 40% were BA students while 60% were MA students. The sample was comprised of 154 women (85.6%) and 26 men (14.4%). The sample was distributed into age groups as follows: 2.2% under 21 years, 63.4% between 21 and 30, and 34.4% over 30 years. In Israel BA students study LIS as their major or minor field. All MA students have an academic background (BA) in LIS (acceptance of students who lack an undergraduate degree in LIS is conditional upon the completion of several mandatory courses). A self-administered questionnaire comprised of the following sections was used in the study:

1. Perceived relationship between librarianship and information science
2. Roles of the librarian and the information scientist.
3. Places of work of the librarian and the information scientist
4. Professional perceptions
5. Personal details

The questionnaire

The questionnaire was divided into five sections:

1. *Perceived relationship between librarianship and information science*
   The aim of this section was to understand if students perceive librarianship and information science as the same profession, inter-related professions or different professions.
2. *Roles of the librarian and information scientist*
   The aim of this section was to examine whether subjects distinguish between the roles of a librarian and the roles of an information scientist. For each of nine roles, subjects were required to assess the extent of their association with the work of librarians and information scientists. Subjects expressed their perceptions on a 5-point Likert scale, ranging from 1 (not at all characteristic) to 5 (very typical). Note that the list of roles below includes no reference to managerial tasks, which are identical in librarianship and information science. Roles are limited to the reference and organization of information. Several roles appear under different terms to maintain reliability of the questionnaire.
   a. Locating information
   b. Building and updating websites
   c. Data filtering
   d. Summarizing information
   e. Referral to reference tools such as dictionaries or encyclopaedias
   f. Classification and Cataloguing
   g. Delivering processed information based on specific user needs (profiles)
   h. Guidance in using information sources
   i. Recommending specific items.
3. *Work places of librarians and information scientists*
   Subjects were presented with eleven names of institutions, including government offices, schools, banks, etc. For each organization on the list, subjects were required to note its suitability as a place of work for librarians, information scientists or both.
4. *Professional perceptions*
   Firstly, this section examined the extent to which subjects perceived both professions to be identical, different or related
   Secondly, in order to examine the difference between the professions of librarian and information scientist relative to other professions, subjects were presented

with a list of seven professions characterized by educational, social and technological dimensions similar to those characteristic of librarianship and information science (Holland 1985; Yablonka 1998). Subjects ranked these professions in the order of their perceived professional status and required training, on a scale of 1 ("most prestigious profession" or "requires the most training") to 7 ("least prestigious profession" or "requires the least training").

Finally, subjects were presented with two pairs of professions, selected from the aforementioned list, assumed to be most similar in status and prestige. For example, 'teacher' was paired with 'librarian'; 'information scientist' was paired with 'software programmer'. Subjects were required to compare the pairs of professions in terms of the following six attributes (;): level of interest, feminine / masculine, salary potential, knowledge, status and required education (Yablonka 1998).

Although knowledge and education may be perceived as separate attributes, these are used as corresponding concepts in the present study as a means of confirming reliability of the research instruments. Students evaluated each of the four professions (two pairs) in terms of each attribute, on a scale to 1 to 5, reflecting the perceived association of each pair of professions to knowledge and education.

5. *Personal details questionnaire*
This section was comprised of three items relating to biographical data, gender, age, education and previous acquaintance with librarianship or information sciences prior to university studies. Two additional items concerned subjects' desire to be a librarian or information scientist, which subjects were required to rate on a 7 point scale from 1 (do not wish to be a librarian / information scientist) to 7 (strongly wish to be a librarian / information scientist). Subjects were also requested to complete an open-ended question regarding their view of the future of the profession.

A pilot study was initially conducted on 15 male and female subjects. In the study phase, 180 questionnaires were distributed to randomly selected students in twenty classes.

Definitions used in the study

Terms used in the questionnaire were defined as follows:

Status – status is a sociological concept relating to social power and prestige. This concept is used to explain several social phenomena. We decided to use professional status perceptions for the present study, based on objective criteria of required education and projected income.

Prestige – Prestige is the admiration, respect or approval granted by an individual or group of individuals due to their performance or qualities, which are perceived to be above average. It may also be defined as admiration towards someone's knowledge and expertise, or respect towards an individual with talents which are especially admirable.

Feminine profession – a profession in which the proportion of women exceeds the proportion of men.

Masculine profession – a profession in which the proportion of men exceeds that of women (Billedi 1990).

Study variables

The variables in the study were as follows:

Independent variables

1. The following sub-branches of the field of study
   1.1 Librarianship
   1.2 Information science
2. Evaluation of the professional:
   2.1 Librarian
   2.2 Information scientist

Dependent variables

1. Typical role perceptions of librarians and information scientists
2. Potential places of employment,
3. Perceived status,
4. Perceived prestige
5. Preferences for librarianship or information sciences.

Findings

The following presents the findings on the five main issues explored in the present study.

Perceived relationship between librarianship and information science

In our study, subjects selected one of the following responses: a) information science is the same profession as librarianship with a different name; b) librarianship and information science are two highly inter-related professions; or c) information science is a completely new profession which is unrelated to librarianship.

Table 1: Distribution (N, %) of Subjects by Responses

	Information science is the same profession as librarianship with a different name		Librarianship and information science are two highly inter-related professions		Information science is a completely new profession which is unrelated to librarianship.		No response selected	
	N	%	N	%	N	%	N	%
BA students	5	6.9	52	72.2	8	11.1	7	9.8
MA students	7	6.5	72	66.7	23	21.3	6	5.5

Table 2: Perceived Roles of Librarians and Information Scientists – Means and standard deviations

Roles	Librarian M	Librarian SD	Information Scientist M	Information Scientist SD	(172 ,1) F
Locating information	3.60	95.	4.51	73.	***01 . 114
Building, and updating websites	1.86	91.	3.71	98.	***55. 348
Data filtering	2.92	1.06	4.07	87.	***74 . 153
Summarizing information	2.34	1.13	3.73	99.	***47 . 214
Referral to reference tools as encyclopaedias etc'	4.25	79.	3.03	1.18	***70 . 120
Classification and cataloguing	4.13	98.	2.66	1.20	***42. 171
Delivering processed information based on specific user needs (profile)	3.08	1.23	4.14	77.	***69. 100
Guidance in using information sources	3.94	90.	3.78	1.04	2.82
Recommendations of specific items	3.94	80.	3.78	1.01	*02 .4

001 . > p*** 05 . > p*
Note. Scale 1–5

Findings (see Table 1) indicate that two-thirds of the subjects in the present study perceive librarianship and information science as highly inter-related professions. Examining the academic status of the respondents, we found that a similar percentage of BA and MA students perceive both professions as identical (6.9% and 6.5% respectively). The percentage of BA students who perceive both professions as related is slightly higher than MA students sharing the same perception (72.2% and 66.7%, respectively). The percentage of MA students who believe that there is no connection between librarianship and information science is almost twice the percentage of BA students sharing the same perception (21.3% and 11.1%, respectively).

Perceived roles of information scientists and librarians

Our study presented nine possible roles for information scientists and librarians, detailed above. Table 2 presents the mean perceptions of students regarding these nine roles. Subjects perceived roles such as referral to reference tools, classification and cataloguing advice and recommendation, guidance in use of information sources, as more strongly associated with the profession of librarianship. Roles relating to the location of information, adaptation of processed information to client's needs, information filtering, summarizing information, building and updating of websites were perceived as roles more strongly associated with the profession of information science.

To examine the statistical significance of these differences, a one-way MANOVA with repeated measures was conducted. Findings indicated a significant difference between the perceived roles of librarians and information scientists ($F(9,164)= 54.39$; $p< .001$). Means, standard deviations and univariate ANOVA tests were calculated separately for each index present in Table 2.

As Table 2 indicates, variance analysis of roles support a significant difference between the perceived roles of librarianship and information science, excluding "guidance in the use of information sources and recommendation of specific items." The largest difference was found regarding the roles defined as "building, and updating websites" and "summarizing information."

Table 3: Distribution of Subject by Perceived Relevance of Workplaces to Librarians and Information Scientists

Place of employment	Librarian N	Librarian %	Information scientist N	Information scientist %	Both N	Both %	χ^2
Community centre	81	56.3	10	6.9	53	36.8	***53.29
Schools	98	54.7	4	2.2	77	43.0	***81.59
Museums	52	32.3	20	12.4	89	55.3	***44.43
Aid organizations	30	24.0	44	35.2	51	40.8	5.49
Hospitals	20	12.7	32	20.3	106	67.1	***82.38
Public institutions	21	12.1	24	13.8	129	74.1	***130.45
Academic institutions	20	11.2	8	4.5	150	84.3	***209.03
Government offices	10	5.8	40	23.1	123	71.1	***118.83
Businesses	6	4.7	90	69.8	33	25.6	***85.53
Banks	4	3.0	91	67.4	40	29.6	***84.93
Hi-tech companies	1	0.6	108	61.4	67	38.1	***99.35

001 . > p ***

Smaller differences were found regarding the roles of "data filtering" and "classifying and cataloguing items." Yet smaller differences were found in the perceptions of the following roles: "locating information" and "adapting processing information to client's specific needs and profile." The smallest significant difference was found regarding perceptions of the role of "advice and recommendations of specific items."

Apparently the roles performed in libraries are perceived as more strongly associated with the profession of a librarian, while roles related to providing information which are defined using terminology relevant to IT and computers, are perceived as more strongly associated with the profession of information science.

The terminology factor apparently influences students' perceptions, as is indicated by the fact that roles attributed to information science (i.e., constructing Web sites, summation of material, providing information on the basis of a personal profile, etc.) obviously take place in the library, and vice versa: roles attributed to librarianship such as guidance is use of information sources or recommendations of specific items, are also performed in information centres and on the private market. This has significant repercussions for LIS curriculum design, as we discuss below.

Potential places of employment

A list of 11 potential places of work for librarians and information scientists was presented to subjects, who were requested to note the relevance of each for librarians, information scientists or both. (Table 3). Chi-square (χ^2) goodness-of-fit tests were used to compare subjects by their classification of the workplaces.

As Table 3 indicates, significant differences emerged between the places of work perceived as appropriate for information scientists and librarians, with the exception of aid organizations. Places of employment with a higher frequency of librarians were community centres and schools. Hospitals, public institutions, academic institutions and government offices were most perceived as appropriate for both professions. Business, hi-tech companies and banks were perceived as most appropriate for information scientists.

Professional status and prestige

Professional status and prestige was examined from two perspectives. First, professions were compared on their perceived prestige rating and required educational attainment. Second, four professions (librarian, teacher, computer professional and information scientist) were evaluated in terms a income potential, required training, status, required advanced education and whether each profession was perceived as a feminine or masculine profession. Bookkeepers, journalists, information scientists, teachers, computer professionals and social workers were ranked by subjects based on their perceived status and required training.

The most prestigious profession was the computer profession (6.36), followed in descending order by information scientist (4.75), journalist (4.66), bookkeeper (4.17) and social worker (3.65). Much lower in ranking were teacher (2.79) and librarian (2.46). Results of an analysis of variance

Table 4: Perceptions of Professions – Means and Standard Deviations

Indices		Librarian	Teacher	Computer professional	Information scientist	F (3, 489)
Interest	M	2.42	3.10	3.34	3.96	***62.57
	SD	1.14	1.08	1.32	96.	
Masculine / feminine	M	1.84	2.00	4.20	2.98	***264.45
	SD	96.	1.00	79.	79.	
Income	M	1.81	2.05	4.76	3.31	***565.21
	SD	84.	91.	47.	81.	
Knowledge	M	3.61	3.93	4.16	4.26	***17.34
	SD	1.07	92.	93.	71.	
Status	M	2.12	2.48	4.69	3.42	***325.79
	SD	92.	1.06	58.	86.	
Academic education	M	3.34	3.98	4.07	4.20	***25.70
	SD	1.18	93.	1.02	76.	

*** $p < .001$
Note. Scale 1–7

with repeated measures pointed to a significant difference between the seven professions (F(6,1044)=129.70; p001. >). In a pair-wise comparison to identify the differences between the various professions, we found that the differences between all professions were significant with the exception of journalist and information scientist.

Ranking of professions was also performed according to the perceived education and training required for each profession. The profession perceived as requiring the highest level of training was a computer profession (ranked 5.86 on scale 1–7), followed by social worker (4.81) and information scientist (4.69). The following professions were ranked slightly lower: bookkeeper (4.42) and teacher (4.26). Lowest ranking professions were journalist (3.28) and librarian (3.15).

Analysis of variance with repeated measures indicated a significant difference between the seven professions (F(6,1026)=49.26; p001. >). In a pair-wise comparison, significant differences between all professions were found, with the exception of the following pairs: teacher-bookkeeper, social worker-information scientist and librarian-journalist.

To further explore students' perceptions of professional status, we also refer to the differences in status perceptions of the following four professions: librarian, teacher, computer profession, and information scientist. Subjects were requested to rank these professions on a 5-point scale, in terms of their own personal interest in the profession, their perception of the profession as a feminine / masculine profession, projected income level, knowledge requirements, status and required academic degree. We used a one-way MANOVA test with repeated measures to capture the perceived differences of these four professions. The test resulted in a significant difference between the four professions (F(18,1458)=72.11; $p < .001$).

Means and standard deviations of the perceptions of these professions, on the six aforementioned dimensions, are presented in Table 4. In addition, Table 4 presents the results of analysis of variance performed separately on each index.

As we can see from the Table 4, univariate ANOVA indicated significant differences in all indices. The largest difference was found regarding income, followed by perceived status, and perception of the profession as feminine / masculine. Smaller differences were found in the interest in the profession, perceived required knowledge or education.

In a pair-wise comparison performed with the intention of exploring the source of differences for each of the indices, we found that all four professions differed significantly in terms of their perceived income. Subjects perceived that computer professionals earn the highest income, followed by information scientist. Perceived income of teachers and librarians was much lower. Regarding professional status, pair-wise analysis found significant differences among all four professions. Similarly, computer professionals were attributed the highest perceived status, followed by information scientists, teachers and librarians, in descending order. Ranking was identical to

ranking of professions in terms of perceived income.

Significant differences were found between computer professions, on one hand, and all remaining professions on the other, and between information scientists on one hand and teachers on the other, in terms of their perception as a feminine / masculine profession. However, no significant difference was found between librarians and teachers. In terms of the order of the professions, computer professions were perceived as most highly masculine, followed by information scientists and librarians. Teaching was perceived to be a feminine profession.

In terms of interest in the profession, a pair wise analysis indicated significant differences between all professions. Computer science was the profession perceived as most interesting, followed by computers, teaching and librarianship.

Perceived knowledge requirements were also significantly different for all professions, with the exception of the difference between computer professionals and information scientists. Knowledge requirements for information scientists were perceived to be highest; slightly less knowledge was required by computer professionals, teachers and librarians, in descending order.

A similar picture emerges regarding requirements of each profession of academic education. Ranking was similar to ranking of required knowledge. Highest level of academic education was perceived to be required by information scientists, computer professionals, teachers and librarians, in a descending order.

Professional preferences

Two items in the questionnaire were designed to assess students' personal desire to be librarians or information scientists. 73.3% of the students noted their desire to be an information scientist while only 27.4% attributed a similarly high rating to their desire to be a librarian.

A paired sample t-test confirmed the significant difference between information scientists and librarians, in terms of students' desire to engage in these field of studies (t=12.70; df=178; p <.001). More students prefer to be information scientists (M=5.30; SD=1.67) than librarians (M= 3.04; SD=1.95). To examine whether professional preference depends on personal attributes, we performed MANOVA analysis on academic status (BA / MA) and gender. In addition, correlations between subject age and professional preference were calculated.

Table 5: Means and Standard Deviations of Students' Desire to Become Information Scientists or Librarians, by Academic Status.

Preference indices	BA students M	BA SD	MA M	MA SD	F (1, 177)
Librarianship	2.83	1.97	3.18	1.93	1.34
Information Science	4.72	1.87	5.69	1.39	***15.62

***p<.001
Note. Scale 1–7

Findings of MANOVA analysis indicated a significant difference regarding academic status (F (2, 176) = 8.01; p< .001). MA students exhibited a higher degree of preference for information science, although no difference was found by gender (F (2, 176) = .61; p > .05). Means and SD of MA and BA students to become information scientists or librarians are presented in Table 5.

According to Table 5, ANOVA tests performed separately for each index indicated significant differences regarding the profession of information science only. Means indicate that the desire to become an information scientist is stronger among MA compared to BA students. Pearson correlations were calculated to examine the relationship between students' age and their professional preference. No significant correlations were found between preferences for librarianship (r=.13; p>.05) or information science (r = .05; p>.05).

Discussion and conclusions

Findings of this study indicate that, despite the fact that most students perceive librarianship and information science as related professions, they also perceive a significant difference between these professions in terms of their prestige, status, roles and potential work environments. Information science was perceived as more interesting, more masculine and having a higher status than librarianship. Information science was also perceived as a profession which requires a higher level of knowledge and / or education compared to librarianship and as a profession with a higher earning potential.

These conclusions are consistent with findings of the study by Harris & Wilkinson (2001), which was conducted in 2000 among students in a Canadian university. According to their study, 60% of the students believe that librarians have no need for higher education. In terms of professional status and prestige, students ranked librarianship last of twelve professions. Law and computer engineering were ranked highest (Harris & Wilkinson 2001).

It is interesting to note that although most roles on the students' questionnaire involve information searches in some form or another, students tended to distinguish between information searches they attributed to libraries based on their use of traditional terminology, and information searches whose terminology belongs to the domain of the Internet and databases. The entire field of information searches related to computerization and the Internet, couched in modern terminology, such as data filtering or building Web sites, was perceived to be the work of information scientists. Although the fundamental meaning of information searches, both in libraries and when searching in digital space, is based on two identical factors (the search for information and the adaptation of information to users' needs), students perceive these roles differently as separate and disregard their shared logical foundation.

Subjects in the present study also distinguished between potential workplaces for librarians and information scientists. Librarians were perceived primarily as public sector employees: in schools and community centres. In contrast, information scientists were perceived as employees in the private sector, businesses, hi-tech companies and places of employment known to be relatively profitable. The transitional phase of the profession is reflected in the fact that several places of employment were perceived as suitable for both librarians and information scientists, including hospitals, public institutions, academic institutions and government offices. In other words, although students ascribed a higher status to information science, they recognize the fact that in a broad range of places of employment, it is still not clear whether a librarian or an information scientist is responsible for knowledge preservation and organization.

Similarly to a large proportion of the public students perceived librarians as service providers whose job requires no profound academic education. Librarians' knowledge is perceived to be general knowledge. Although librarians have been engaged in data retrieval in universities, research institutions and hi-tech companies since the introduction of CDs and the BITNET network in the 1980s, librarians are not perceived as data retrieval and processing specialists. In light of these perceptions, it is not surprising that most students, and a preponderance of MA students, prefer to work as information scientists.

There is no doubt that information science today includes fields of specialization in computers and communications which are traditionally unrelated to librarianship. These new specializations, which include technological developments for data mining, Web site construction, knowledge management, information marketing, interface and the user, theoretical and practical research in the fields of information behaviour and information organization, have added a new dimension to the field of librarianship. The question remains whether this dimension will evolve as separate from librarianship or will become an integral part of the transition from the world of print to the digital world.

Students in the current study emphatically prefer to be known as information scientists, fill positions of information scientists and gain prestige in sectors such as the hi-tech community. They also wish to present themselves in this innovative manner, when employed in public or academic institutions, or in the private sector. By incorporating and exhibiting elements of advanced technology, they in fact wish to upgrade the status and prestige ascribed to their profession.

Various studies have explored the factors which account for the status and prestige of a profession (Spaulding 1989; Lam 1994; Davies 1996) and propose three resources for professional prestige and status: financial rewards, authority and knowledge. The financial rewards of librarianship are humble, as is the authority. The unique nature of this profession lies in its concern with knowledge. However, when expertise in using advanced technologies is combined with new professional terminology an attribution of financial awards and knowledge will gradually emerge.

Students' motives and rationalizations are easy to understand. When asked about their professional future in an open-ended question, most

saw a better future for information scientists than for librarians. The KALIPER study findings that confirm the very introduction of information science studies into schools of librarianship indicates that this trend is shared by educational institutions as well.

Librarianship is in a significant transition phase, in which students' perceptions may determine the future nature of the profession. The students in the present study exhibit ambition and a desire to upgrade the profession with which they are associated. As agents of change in this transition, students will play a major role in and ultimately may cause the replacement of the term of librarian with the title of information scientists.

One of the significant conclusions of the present study is the need of LIS school directors to take into consideration their students' perceptions and expectations in curriculum design. In light of the important role of libraries and reading in educational and community settings, the status of the librarian should be upgraded, possibly through the modification and modernization of LIS terminology and an added emphasis on information technology as a tool to promote libraries and enhance library use. Despite the fact that these changes have already been implemented in LIS schools to some degree, libraries as modern innovative institutions integrated print and digital materials has not yet penetrated students' perceptions. From our experience at Bar Ilan University, the change of the department's name in the early 1990s to "Department of Information Studies and Librarianship" and the corresponding change in the contents of the courses, led to a significant increase in enrolment. Within a short number of years, several hundred students were enrolled in the department. Moreover, the number of male students increased as well as students with backgrounds in social sciences and natural sciences. Although this process may have had the effect of undermining the significance of the librarian's role, it constituted a lever for the development of libraries and their transformation into modern centres of knowledge and information.

Based on the traditional role of librarians in preserving knowledge and information over history, bibliophiles may cling to the traditional term of the librarian. However, in times when professional status and earnings facilitate employees' promotion and the advancement of the profession, we may be gradually compelled to replace the traditional term "librarian." We can only hope that information scientists working in libraries will not only incorporate new and innovative technological dimensions of the practice, but will also upgrade reading and reference activities and improve the image of libraries as modern cultural institutions which combine both – old and new – books, digital devices and the love for human spirit.

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