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A Comparative Study on Information Seeking Behavior of B.Sc. & M.Sc. Agricultural Extension & Education Students

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Introduction

In Iran, Nature of field of agricultural extension & education is multidiscipline; so it is crystal clear that, agricultural extension and education students need information to obtain higher level of knowledge in a field for preparing academic course homework and project papers using a variety of information sources and services. Also, in Iran, toward improving knowledge about agricultural extension and education field, providing the basic academic facilities for information seeking process is necessary. Information seeking behavior is a broad term, which involves a set of actions that an individual takes to express information needs, seek information, evaluate and select information, and finally uses this information to satisfy his/her information needs (Majid and Kassim, 2000). In other hands, Information seeking behavior is considered a multifarious, dynamic, social human behavior that needs a picture as rich as possible to truly understand the phenomenon, and then, many questions will be answered (Gureshi, Zafar and Bashir khan, 2008).

Literature Review

In the study of Graves and Seliq (1986), they emphasized the importance of the medical library's role in developing life long learning skills in medical students. They pointed out that students need to develop skills in information management and the use information tools and databases. Undergraduate students often do not comprehend the necessity of learning to use the library resources available to them, nor do they always realize that research skills will be a necessary part of their future practice of medical profession (Graves and Seliq, 1986).

Delzer and Leysen (1988), at their study about library use and information-seeking behavior of veterinary medical students for veterinary medical students at Iowa State indicated that the library was most frequently used for studying and for making photocopies of materials. The typical respondent relied on course textbooks and handouts for current information on unfamiliar topics, instead of using indexes or abstracts for guidance to recent literature. Light use of library information resources raises the concern that students are developing an inadequate base of retrieval skills for finding information on new procedures, diseases and drugs. No differences were found between students with and without formal bibliographic instruction in their approaches to seeking information or in library use (Delzer and Leysen, 1988).

Findings of Fidzani (1998) indicated that guidance in the use of library resources and services is necessary to help students meet some of their information requirements. The study found that: journals, library books and textbooks are the most popular sources of information for course work and research and those students need to be taught how to use available library resources and services.

In another study, Whitmire (2001) examined the differences in library use attributed to students at different class levels. The survey investigated the library experiences of undergraduate students during their three years of study. Overall, library use was low for students in first, second and third year. However, the extent of participation by students in the various library activities did increase

during the three years of study for 7 of the 11 library experiences. Asking the librarian was the one experience that decreased between the first and the third year undergraduate students. Using the computers in the library was the most important activity for undergraduates at all stages of their studies where it achieved the highest level of activity for the second and third year students and the second highest score for the first year students. Using the library catalogue (card or online) was reported as the activity that received the highest score for first year undergraduate students and the second highest score for second and third year students. Using the library to read or as a place of study was the third highest activity for first and second year undergraduates at this university and ranked fourth for third year undergraduate students. Using reference materials was the least popular activity engaged in by all class levels.

Drabenstott (2003), examined strategies used by fourteen undergraduates in a single search session employing a so-called information gateway, a university library's home page on the web that provided one entry point for access to the library's online resources. She concluded that few undergraduates were able to enlist search strategies commonly taken by domain experts (i.e., subject experts like professors) and when they did, domain-expert strategies were used infrequently and ineffectively.

Jarvelin and Ingwersen (2004) studies examine students and academic settings to explain competency theory admits application in analyzing information seeking behaviors in those who do not realize their own incompetence and therefore overestimate their abilities and other people's performance. Low-level information-seeking skills may then affect individuals' ability to recognize the need for information and the value of libraries and other information providers. Information professionals need to recognize low-level literacy skills and library anxiety in all service populations in order to provide outreach and systems to assist these students or patrons.

Song (2005) compared information seeking behavior of domestic and international business students enrolled in the College of Business at the University of Illinois at Urbana-Champaign. Results of study showed only 6% of international business students responded that they initially go to the home page of the commerce library to conduct research, compared to 17% of domestic business students. About 94% of international business students initially go to either Google or Yahoo. This result implies that the library needs to develop ways to increase the use of library databases by both student groups, but especially by international business students. Both student groups need to be educated that search engines such as Google and Yahoo do not search specialized and proprietary databases that require subscription. The survey results offered insights into understanding different perceptions of these two student groups with respect to their library use patterns and research strategies.

Kim (2006) in his study about student use of library databases found that convenient access was an important determinant of database use. Some students preferred open Internet searches to web-based subscription databases simply because of their convenience. Kim goes on to note that competing with Internet searching must be a priority for libraries in the future: To compete with open internet searches and facilitate use of Web-based subscription databases, it is crucial for libraries to increase the convenience of access and awareness of the existence of the databases.

In another study, Gureshi, Zafar and Bashir Khan (2008), discovered in their research of students' information seeking behavior in Universities of Pakistan that, Lack of awareness of available resources and ability to use tools are big causes that highly affects information needs and seeking behavior of Pakistani students.

Callinan (2005) reported on research conducted at University of Dublin comparing final year biochemistry students' and first year biology students' EIS use. Callinan found that the e-library was used by 27% of the first year biology students and 56.5% of final year biochemistry students suggesting that first year students are under-educated in the information seeking technology and processes.

Overall, the study factors are included: academic year (Callinan, 2005; Adeyinka, 2007), grade point average (Shanmugam, 1999; Onwuegbuzie & Jiao, 2004), capability in English language (Sarkodie-Mensah, 2000; Curry & Copeman, 2005), availability of information resources (Zhang, 2001; Kim, 2006; Lee, 2008), awareness of information seeking methods (Hert, 1998 & Majid & Kassim, 2000), satisfaction of library services (Kuhlthau, 1999 & Whilmire, 2001), Satisfaction of working with internet (Bruce, 1998 & Santosa et al., 2005), awareness of internet information resources and skills of internet (Santosa et al., 2005 & Alison, 2008); awareness of library information resources and library searching skills (Kim, 2006 & Gureshi et al., 2008). Figure (1) highlights the relationship between the independent variables and the dependent variable.

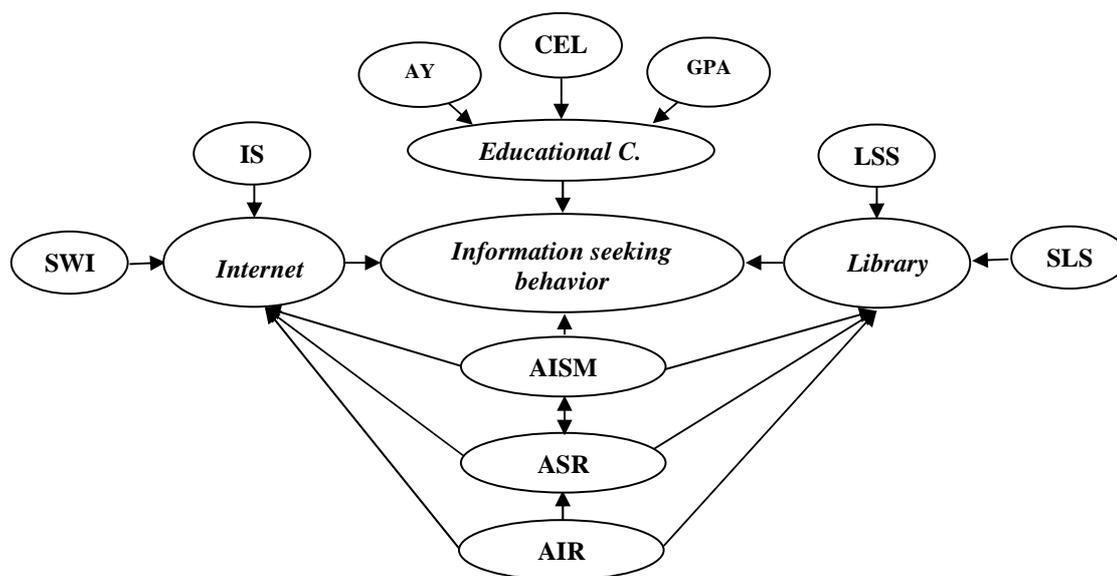


Figure 1. Research model for students' information seeking behavior

AY: Academic Year	LSS: Library Searching Skills
GPA: Grade Point Average	SWI: Satisfaction of Working with Internet
CEL: Capability in English Language	ASR: Awareness of Scientific Resources
AIR: Availability of Information Resources	AISM: Awareness of Information Seeking Methods
SLS: Satisfaction of Library Services	IS: Internet Skills

In different researches carried out on the information seeking behavior of students, little attention has been paid to the influence of new educational conditions, instructional goals and the circumstances under which students can access the information resources considering higher educational levels. Definitely higher educational levels will influence some components of information seeking behavior in students. Therefore, this research tends to determine those components of information seeking behavior which are influenced by the change of educational level, and in some way, specifies the level of influence that new academic and instructional situations have on the information seeking behavior of students at both different levels. Obviously, the research results will better clarify faculty members and librarians' duties toward improvement of the information seeking behavior of students and will contribute to plan properly for the same.

So, result study is for faculty members, staff and academic libraries to adequately address the changing information needs of its students, they need to know more about the information that students use and value and what influences their information searching, obtaining, and use. To address these questions this study explores students' information seeking behavior as they pursue their scholarly activities, the role of human resources, internet, the academic libraries, and other influences (George et al., 2006). Therefore, the main purpose of this study was to compare information seeking behavior (ISE) in B.Sc. & M.Sc. students of agricultural extension and education. The special objectives of the study were:

1. To compare information seeking behavior in B.Sc. & M.Sc. agricultural extension & education students;
2. To compare varieties in information-seeking behavior between two groups of students, by educational levels;
3. To compare amount of available information resources at 4 Universities and its effectiveness on students' information seeking behavior;
4. To compare research & educational outputs in B.Sc. and M.Sc. students.

Methods

The statistical population of the study was consisted of 650 students who were studying in B.Sc. & M.Sc. levels in public universities of Iran. Sample size was determined by using Krejcie & Morgan table (1970). By using stratified proportional random sampling 290 students were selected across in the famous universities of Tehran, Shiraz, Mollasani and Razi Kermanshah.

The questionnaire had a total number of 143 statements in 12 scales, which was primarily divided into five main sections that consisted of:

1. Individual- academic characteristics and capability in English language in responding (22 statements);
2. The subjects related to library (55 statements), by Using of Likert Scale (Very Frequently, Frequently, Occasionally, Rarely, Very Rarely, Never).
3. The subjects related to Internet (51 statements), by Using of Likert Scale (Very Frequently, Frequently, Occasionally, Rarely, Very Rarely, Never).
4. The subjects related to level of information resources availability (15 statements). Also, for determined of exact information resources availability, it using of secondary documents in statistical recourses of faculties and departments.

The Cronbach's alpha computed to measure reliability of the " main indexes " was up of 0.73, which showed questionnaire had acceptable reliability. The questionnaire was validated by a panel of universities faculty members (departments of agricultural extension and education & Library and Information Science, university of Tehran) after necessary corrections and was pre-tested against a sample of 50 students. Data analysis was carried out in two sections, consisting data description and data inferential analysis. Statistics such as frequencies, mean, standard deviation, C.V and scale free. Also, in data inferential analysis: regression analyzes, Pearson correlation, Delphi method, principal components analysis method, division by mean method, was used in the descriptive section.

For calculation of students' ISB, since the measurement units of main varieties are different, so at first, used of scale free technique and "division by mean" method. In after step, with attention to the main varieties not equal about importance degree, therefore for their weighting, used of Delphi method in 3 steps. With other hand, Specifying suitable coefficient for each of general variables of information seeking behavior is required for the final calculation of the information seeking behavior of students. Despite the fact that factors which influence information seeking behavior of students are often common in different countries, they don't have the same level of importance considering instructional system, culture and university facilities. Therefore it is necessary to utilize the opinions of each country's information science and library science specialists to calculate the importance level of each of information seeking behavior variables (Delphi Method) more exactly. Therefore, According to table (1), for calculation of students' ISB, computed the weights of 10 main varieties (by 10 faculty members of Library and Information Science department in famous universities of Tehran & Mashhad Ferdousi). The final step, the mount of varieties multiplied in their weights and calculated grand total as amount ISB for any student.

Table (1). Weighting of main varieties in ISB, based on Delphi method

varieties	Grade point average	Academic year	Awareness of library seeking methods	Satisfaction of working with internet	Library searching skills	Skills of internet
Weight	0.55	0.50	0.59	0.30	0.45	0.48
varieties	Satisfaction of library services	Availability of information resources	Capability in English language	Awareness of library scientific resources	Awareness of internet scientific resources	Awareness of internet searching methods
Weight	0.36	0.75	0.50	0.72	0.62	0.58

Considering the fact that the facility gap in agriculture faculties of different universities under research were so much and also mental criteria of students to ordinarily calculate the level of access to the information resources were not the same, the indicators of

access to the universities information resources were used in this research to calculate the level of access to the information resources more exactly. It has been proved that several factors are affecting on the students' availability levels in libraries & internet information resources. In this study, because the indicators' unites are different, using scales free technique was necessary. Division by mean method was applied for scale free (Kalantari, 2002). For weighting indicators, principal components analysis method was used. The factors for scaling free were derived from analyzing secondary information resources (statistical references for any university) and 15 items related for availability of information resources, in questionnaire.

Results Educational Characteristics of the respondents

According to table (2), respectively, the statistical population of B.Sc. & M.Sc. agricultural extension & education students in Tehran University was consisted of 17% & 42%; in Shiraz University, 22% & 25%; in Razi Kermanshah, 40% & 13% and in Mollasani University, 21% & 20%. Among all the agricultural extension and education students (in B.Sc. level) 67% were found female and 33% male; and in M.Sc. level 70% were found female and 30% male. Also, respectively in B.Sc. & M.Sc. levels, 77% & 52% of study population had never passed any information seeking educational courses in library and internet. Majority of B.Sc. students (91%) and M.Sc. students (87%), only used of information resources of university for taking of information.

Table (2). Frequency distribution of agricultural extension and education students

Departments of agricultural extension and education	Educational levels							
	B.Sc.				M.Sc.			
	Male	Female	Sample size	Percentage	Male	Female	Sample size	Percentage
Tehran University	14	23	37	17	11	14	25	42
Shiraz University	19	32	51	22	2	13	15	25
Kermanshah University	24	68	92	40	1	7	8	13
Mollasani University	18	32	50	21	4	8	12	20
Total	75	155	230	100	18	42	60	100

Comparison of amount of students' ISB, based on educational levels

Comparison of information seeking behavior level in B.Sc. and M.Sc. agricultural extension & education students (table 3); indicate significant difference between two groups of students on information seeking behavior capability. In other words, this comparison revealed that M.Sc. students had higher level of information seeking behavior than B.Sc. students.

Table (3). Comparison of respondents' information seeking behavior, based on educational levels

Variety	Educational levels	Mean	t- test value	Standard deviation	Sig.
information seeking behavior	B.Sc.	16.85	9.720	-5.775*	0.039
	M.Sc.	31.75	1.046		

* Correlation is significant at the 0.05 level (2-tailed).

Comparison of varieties of ISB, based on educational levels

Comparison of varieties of ISB (table 4) ; indicates significant differences between B.Sc. & M.Sc. agricultural extension & education students on awareness of internet science resources, awareness of internet information seeking methods, awareness of library resources, capability in English language and availability of information resources. On the other hand, there were no significant differences between two groups of students based on their satisfaction of library services, and working with internet, library searching skills, awareness of library information seeking methods and internet searching skills.

Table (4). Comparison of B.Sc. and M.Sc. students' ISB

Varieties	Educational levels	Mean	t- test value	Standard deviation	Sig.
Awareness of internet science resources	B.Sc.	18.03	12.148	-5.543*	0.021
	M.Sc.	31.78	9.526		
Internet searching skills	B.Sc.	21.74	10.339	-4.919	0.189
	M.Sc.	23.47	9.177		
Awareness of internet information seeking methods	B.Sc.	19.55	5.585	-6.951**	0.008
	M.Sc.	22.95	4.366		
Satisfaction of working with Internet	B.Sc.	17.89	4.885	5.621	0.413
	M.Sc.	19.90	4.894		
Awareness of library resources	B.Sc.	19.93	12.506	-9.733**	0.00
	M.Sc.	29.83	9.654		
Library searching skills	B.Sc.	23.03	6.504	-3.192	0.651
	M.Sc.	26.02	6.453		
Awareness of library information seeking methods	B.Sc.	19.18	4.665	-0.189	0.285
	M.Sc.	19.30	4.171		
Satisfaction of library services	B.Sc.	19.56	4.616	-1.087	0.454
	M.Sc.	20.30	4.710		
Capability in English language	B.Sc.	11.46	4.564	-3.323*	0.046
	M.Sc.	16.57	3.581		
Availability of information resources	B.Sc.	8.88	6.523	-2.225*	0.029
	M.Sc.	15.73	4.266		

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Comparison of availability of information resources, based on educational level

For calculation of amount of availability of information resources (internet and libraries), at first, the first items were made for any information resource; in step 2, each ratio were divided in total mean of all ratios (by division by mean method).

In step 3, indicators are weighed by Principal Components Analysis technique. This at least, calculated the component indicators for information resources:

Making indicators for libraries resources

- Step 1: At first, ratios were considering for libraries resources at the beginning:

Indicator 1 (I_1): Number of related books to the major / total number of department students.

Indicator 2 (I_2): Number of librarians working in central part / total number of faculty students.

Indicator 3 (I_3): Number of scientific journals / total number of department students.

Indicator 4 (I_4): Number of computers for searching / total number of faculty students.

Indicator 5 (I_5): Average number of working hours for library per day / average number of hours for library being used by students per day.

Indicator 6 (I_6): Average number of printed material, related to agricultural extension and education field, being borrowed by department students per month / total number of printed material, related to agricultural extension and education field.

Indicator 7 (I_7): Number of theses, dissertations & research plans / total number of department students.

Step 2: Each ratio divided by total mean.

Step 3: Weighting of indicators by principal components analysis technique.

Step 4: At least, Component indicators (CI) make for availability of library resources:

$$\text{Component indicators (CI)} = W_1I_1 + W_2I_2 + W_3I_3 + W_4I_4 + W_5I_5 + W_6I_6 + W_7I_7$$

Making indexes for availability of internet resource

- For B.Sc. students: Step 1:

Indicator 1 (I₁): Number of computers in department for B.Sc. students / total number of B.Sc. students at the department.

Indicator 2 (I₂): Number of computers in the faculty central site for undergraduate students / Number of B.Sc. students in faculty.

Indicator 3 (I₃): Average number of working hours for internet sites, per day / average number of hours for internet sites being used by B.Sc. students, per day.

- For M.Sc. students: Step 1:

Indicator 1 (I₁): Number of available computers in department for M.Sc. students / total number of graduate students in department.

Indicator 2 (I₂): Number of available computers in faculty central site for graduate students / total number of graduate students in faculty.

Indicator 3 (I₃): Average number of working hours for internet sites, per day / average number of hours for internet sites being used by M.Sc. students, per day.

Step 2: II₁: I₁ / Mean (I₁), II₂: I₂ / Mean (I₂), II₃: I₃ / Mean (I₃)

Step 3, Step 4: Component indicators (C_I) = II₁ + II₂ + II₃

- Final step: Availability of information resources = (Total of libraries indicators + Total of internet site indicators)

Table (5) shows that M.Sc. students had higher availability of information resources than B.Sc. students. In addition, B.Sc. agricultural extension & education students in Shiraz University and M.Sc. agricultural extension & education students in Tehran University had the most availability information resources. Also, it is notable that, B.Sc. students in Tehran University and Shiraz University have the more availability of information resources than M.Sc. students in Universities of Mollasani and Razi Kermanshah.

Table (5). Comparison of availability of information resources, by educational level

Agricultural faculties	Educational Level	Component indicators (Libraries)	Component indicators (Internet)	Total indicators
Tehran University	B.Sc.	10.18	4.22	14.40
	M.Sc.	14.39	2.61	17
Shiraz University	B.Sc.	10.48	3.60	14.08
	M.Sc.	13.19	3.07	16.26
Razi Kermanshah University	B.Sc.	6.56	2.24	8.80
	M.Sc.	7.43	4.24	11.67
Mollasani University	B.Sc.	4.99	2.01	7
	M.Sc.	5.08	2.04	7.12

Comparison of research & educational outputs in B.Sc. and M.Sc. students

Quantitative outputs of the information seeking behavior in students appear in two forms of instructional output and research output. Determining the quantitative output type of the information seeking behavior in students at two different educational levels of the same educational field will greatly influence the plans for the promotion of information seeking behavior of students at that educational level. So, respectively, total of applied or reviewed papers and grad point average (GPA) were appointed in indexes of research output

and educational output in students' ISB. Due to the results of table (6), there is no significant difference in amount of ISB between B.Sc. students who had not any paper and B.Sc. students who had 1 or more papers; but there is significant difference in amount of ISB between two groups of M.Sc. students. Also, table (7) showed that there was positive and significant relationship between GPA and amount of ISB in B.Sc. students. But, there was no significant relationship between two groups of M.Sc. students.

Table (6). Comparison of research output in B.Sc. and M.Sc. students

Educational level		Total of papers	Mean	Standard deviation	t- test value	Sig.
research output	B.Sc.	No paper	16.529	5.534	1.255	.301
		1 or more papers	18.875	4.757		
	M.Sc.	No paper	26.757	2.107	-8.441**	0.003
		1 or more papers	34.963	3.311		

** Correlation is significant at the 0.01 level (2-tailed).

Table (7). Correlations Matrix of students' ISB and GPA (educational output)

Educational level	Pearson correlation	Sig.
educational output (GPA)	B.Sc.	0.398**
	M.Sc.	-0.045

** Correlation is significant at the 0.01 level (2-tailed).

Conclusion

The purpose of this study was to determine the weakness points of information seeking behavior, with attention to promotion of educational level in B.Sc & M.Sc. agricultural extension and education students. With attention to results (see table 4), varieties of internet searching skills, library searching skills and awareness of library information seeking methods, there are not significant difference between two groups of students. According to, majority of students had never passed any information seeking educational course in library and internet; so, it seems, it is necessary to establish the information seeking education courses through internet and library as a main subject in departments of agricultural extension & education or curriculums content.

The study results (see table 5) showed, Above all, M.Sc. students had higher availability of information resources level than B.Sc. students. With attention to, the majority of B.Sc. students (91%) and M.Sc. students (87%), only used information resources of university; but, in comparison to availability of information resources between two groups of students, information services gap of information resources in different Universities was noticeable.

For example, availability of information resources between B.Sc. students in Universities of Tehran and Shiraz was higher than M.Sc. students at Universities of Razi Kermanshah and at Mollasani. It is very important to improve information resources services proportionality in departments of agricultural extension & education in different Universities.

Although, students with high level of ISB, generally are expected to have higher level at any two research and educational outputs, but this study (see tables 6, 7) revealed that B.Sc. students' ISB is only, toward improving educational output; but M.Sc. students' ISB is only, toward promoting research output. It seems that, B.Sc. students' ISB is only to improvement academic educational level and performance of their homework and quizzes; and in M.Sc. students, it was only for promotion of research records (increasing of advantages for taking educational Level of PhD or employment). Maybe, it ignored to improving research output in B.Sc. students and educational output in M.Sc. students.

With attention to result of table 4, it is obviously clear that, the effect of faculty's teaching strategies and the change of their ideas toward promoting information seeking behavior are clearly important in promoting of students' information seeking behavior. So, teaching the usage of information should be part of all students' education. Also, the faculty members during their teaching should identify some suitable skills in internet and library for promotion of students' performance in their homework and projects. In other hands, if faculty members and university administrators keep a critical eye and encourage analyzed factors, then there will be positive results on Students' information seeking behavior.

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