2014

Educating for Information Literacy : Assessing Indian Agricultural Sciences graduate's knowledge and Information skills

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Abstract

The article makes as survey of graduate students knowledge on use of various library and learning resources and their information skills. Students across disciplines of Horticulture, Seed science, Vegetable science of G B Pant University of Agriculture & Technology were assessed, questions were posed to know how they perceived themselves capable of knowing information sources, arrangement, interpretation and location of physical items in library, knowledge of bibliographical database, academic search engines, use of library website, subject gateways, and library networks etc. The survey also makes an effort to know students attitude as to how they informed themselves about latest development in their subject and how they would like to be informed about library news and learning resources. The survey was made before the commencement of one credit course on information literacy, and the limited knowledge of graduate students was expected in skill areas. The finding reveals that there are notable gaps and students' knowledge is digitally divided. Suggests that teaching of credit bearing IL courses is imperative to enhance graduate students knowledge and information seeking skills.

Key words : Information literacy-India, library instruction, Agricultural -Information literacy , information skills-India , Graduate information skills

Introduction

In the present era of IT revolution, access to agricultural information has become vital for the development of agricultural production leading to food security and sustainable use of land water and natural resources. Indian Agricultural universities, colleges and research centers have been playing an crucial role in imparting education fostering research needs of the country and forwarding extension services. The Libraries and Information Centre of agricultural universities have grown along with the growth and development of these organizations and have been providing valuable information catering to their needs. In order to bring qualitative improvements in education of agricultural sciences, most agricultural universities in the country are offering a distinctive credit bearing course integrated into regular curriculum to educate the students and enhance their skills on use of learning resources, techniques of information retrieval, use of databases and e-resources and also to expose them to various sources and gateways of information.

User instruction in Agricultural Universities of India had its beginning from the land grant colleges of American agricultural universities. US land grant universities assisted India during the

green revolution in 1960s and many state agricultural universities were established such as G B Pant University and other were modeled after the US system. Many agricultural universities in the country had their roots from these colleges and followed the land grant pattern of imparting education. Educating students the users and information literacy or information competency was considered essential by the academic council of agricultural universities and this was made part of the curricula, ideally to teach the students on use of library and identify and evaluate information sources and to develop their information seeking skills.

 Information literacy has received increasing attention in research and scholarship as well as professional practice among information professionals with emergence of electronic resources .There has been paradigm shift from stand alone libraries to networked or digital libraries. Today as the information resources are increasingly being digitized and libraries focusing exclusively on digital progression, refining and automating their activities using state of the art technologies, besides activities like developing databases and providing access to several web based information housed in remote server locations across the world. The relevance of these courses has not only become important but also mandatory to cope and adjust with the present information age. To use these high end automated and electronic libraries having digital resources in machine readable form and to access databases, the users need to be educated on evaluation and retrieval techniques to be able use of OPACS and digital information. Information literacy is therefore important, Briefly, Information literacy as defined by ALA *is a set of abilities requiring individuals to recognize when information is needed and have ability to locate, evaluate, and use effectively the needed information.*

Library skills classes are typically used method for the development of information literacy ,
at G B Pant University of Agriculture and Technology the course was started way back in 1976 by the name *"Use of Scientific Literature "* under trimester system which was later updated and changed to *"Storage and Retrieval of Scientific Information"* in semester system. The course is one credit with tutorials and offered to graduate students of all disciplines of Agricultural sciences in the first year of the university. First year is critical time to engage students with learning activities and provide resources for acquisition of academic skills essential for their academic success. The course is currently optional yet and graded in the final examination. This study has been taken to find graduate students knowledge about information resources both physical and electronic resources and their information seeking and interpreting skills.

Research Review

Some examples of early studies in information literacy are by Cameron (1983), that revealed the knowledge level of senior major students at James Madison University, over half of the students did not know how to use the MLA international bibliography, one of the key resources in the field . She also found that Psychology major showed poorly on questions to use of APA's Thesaurus of Psychological indexing terms. Verginia Tiefel (1989) reported that students generally failed to realize the substantial differences between school/ public and academic libraries and therefore over estimate the extent of their knowledge of the later. Parrish (1989) stated that discussion of library services through orientation programs had low impact and reported low attendance,   Another survey by South Bend , Brian R Schuck (1992) reported on general library skills among undergraduates at Indiana University and found that on average a fair number of students

encountered problems on such sources /systems as library of congress subject heading list, library's own periodical holdings and libraries Call Numbers system. Piette and Dance (1993) in their survey found that tailored Information Literacy programs for students had more positive responses and filled in knowledge gaps. Coupe (1993) in her study of library skills among undergraduates at John Hopkins University found that less than half of junior and senior students were able to identify call numbers for retrieval. Only 40% knew not to search online catalogue and to identify journal article less than 35% could distinguish between citation to a book and one to journal article.

Brown (1999) in his study revealed that information Literacy programs helped students to assess themselves, to be able to successfully determine the extent of information needed, access information effectively, evaluate critically and incorporate information into their knowledge basis and use information effectively.
 Some latest researches in Information literacy by Green and Bowser (2006) and Proulx and Mallet (2006) on cooperative teaching arrangement between instructors and librarians throughout the semester, indicated that cooperative study communicates library services and IL to students quite well. The partnership has been noted in social sciences or education graduate programs which tend to offer more structured research and thesis writing. Green (2006) and Schmidt (1993) found that topics in these types of sessions includes developing search strategies tools, evaluating sources and discussing how to conduct a literature review.
  Researchers Chrzastowsk and Joseph (2006) and Jankowska et al (2006) found that graduate students primarily use journal articles rather than books, they preferred electronic access and cross database searching, further providing appropriate collections for graduate students is key role of academic librarians and ensuring that students know, how to appropriately use and evaluate information is equally
important. the study also found that graduate students (like many information seekers) learn about library and their information need from their peers , once they realize that advice from their fellow peers is not sufficient and fulfilling their information need they appreciate and prefer a personal library liaison or information literacy to help and guide them in their research process.
    In addition to curriculum based library instruction or information literacy, Workshop approach to information literacy is presently gaining importance across many subject disciplines. Workshop are independent from curriculum based course so they can be targeted towards wide variety of graduate students and can be held at any time. A research by Harrison et-al (2005) found that workshop for graduates students can focus on teaching students specific tools, for example bibliographic management software. Another study by Fyffe and Walter (2005) found that through workshop approach graduate students can explore more theoretical concepts such as copy right issues, concept like students responsibilities as future faculties etc
Gross, M and Latham D (2007) argues that traditional information literacy instruction may not be effective with non proficient students who are unlikely to see themselves as needing or benefiting from such instruction. Rempel and Davidson (2008) on providing IL to graduate students through Literature Review Workshop found that graduate students responded well to conference style environment and actively participated in small group. Students were not up-to-date with library tools and new technologies as we might think. Many were unfamiliar with tools like citation database and benefits of controlled vocabulary etc . The pre-registration and pre assessment facilitated students engagement by encouraging them to think about what they already knew about the literature process and library services and what they needed to know more.

A study by Brasely and Sterling (2008) on information literacy programs emphasized the role of librarians and disciplines faculty collaborative models for integrating information literacy beyond one dimensional definition of IL. Ensuring that students being future citizens should be equipped to handle multidimensional facets of information the economic, social, cultural, technical and ethical demands of information and this is a calls to action the educators. The authors have described a framework for collaboration between librarian and discipline faculty for multidimensional IL development and infusion.

Harrington Marini (2009) investigating on how psychology students find information for coursework and research in University of Western Ontario indicate that graduate students were comfortable in using libraries, preferred electronic resources and had interest in furthering their information literacy knowledge. Authors suggests, research librarians to focus on being more proactive rather than expecting students to come for assistance. When assessing IL of 26 Indian agricultural universities, Singh N (2010) identifies that most universities provided credit bearing courses to Graduate students and some universities to PhD students and focused on teaching library skills blended with research and scientific writing. Universities being a subject to state control find difficult to work towards a uniform, embedded curriculum approach for information Literacy. The concept of subject librarians for teaching Information literacy unlike many European or American libraries is yet to be incorporated into Indian situation .

A more recent study by Price, Beker, Lynette, and Collins (2011) on embedding IL in first year for undergraduates of business studies at Australian university pretested their IL skills and found that students encouraged the need of greater skill development suggesting that skill development activities need to be made accessible.

Carlson, Fosmine Miller and Nelson (2011) in their study for accessing data information literacy in Geo informatics students at Perdue university revealed in their pre survey that several students had rudimentary button pushing understanding of technologies and non indicated to be able to command the tools to accomplish their ideas and solutions. They also reported little experience with GIS limited to handful of data types. The survey revealed low levels of exposure to most course content of IL .In end of course evaluation students remarked that after taking the course they understood what they were doing and were more confident to contribute to new procedure to their research.

Methodology

Data has been collected and composed from a brief questionnaire circulated to graduate students across three departments of Horticulture, Seed Science and Vegetable Science in six academic sessions/ years from 2007-2012 before the commencement of the course "Storage and Retrieval of Scientific Information". The academic session in the university commences from July-August until next June. Each department has eight seats including two candidates admitted from Indian Council of Agricultural research (ICAR). The course being optional, each academic year 13 students opted for the course in the year 2012, only six in 2011, 12 students chose to study the course in 2010. A total of 16 students opted for the course in 2009, 14 students in 2008 and 13 students in the year 2007. In order to access IL skills of students the data collected has been classified, evaluated and analyzed and accessed to determine the various dimensions of this study.

Scope and Limitation

Access to data and timely completion are important factors for accomplishment of prerecorded objectives of any investigation. Hence, keeping in view these factors this study is limited to the graduate students of College of Forestry and Hill Agriculture of G B Pant university of Agriculture and Technology, the study set forth the following limitation.

1. The study includes graduate students, of three disciplines i.e. Horticultural sciences, Vegetable sciences and Seed sciences of college of forestry and hill agriculture.
2. Understudy covers data collected from students in six academic years 2007 to 2012.

The idea behind carrying out this study is to provoke further discussions based on students'views and reflections rather than to sharply draw any conclusions.

Main Objectives

This research is under taken with the objectives of knowing if the graduate students (of three departments stated above) perceived themselves capable of being able to identify evaluate and use information sources and of have retrieval skills. Besides having knowledge of search engines, bibliographical databases, library networks, subject gateways, library catalogue/ OPAC etc.

Most user studies have looked at situation through the eyes of the information and library professionals rather than the users, the present study takes care of the users views and their situation. The objective are to;

1. Know why the students wanted to study this course, and who advised them.
2. **Understand** students knowledge on use of catalogues /OPAC and how they learnt it.
3. **Assess** their knowledge on bibliographical databases, search techniques, subject gateways and library networks.
4. Examine students knowledge and skills on search engines used in searching academic materials.
5. Determine if they had knowledge about Call numbers and if used library website .
6. Find if they knew about abstracting, indexing periodicals, citation databases and its usage .
7. Learn how students informed them selves about new developments in their subject and how they would like to be informed about library's new acquisitions, learning resources and other news.

Analysis and Discussions

 The data collected from graduate students across three departments is analyzed keeping in view the stated objectives. In order to ascertain the students interest on opting the one credit course Storage and Retrieval of Scientific Information, majority of the students more than 44.% stated that they wanted to learn about various skills in information search to help them selves in their research and thesis work. Forty two percent said that were keen on learning various retrieval

techniques and sources of information, some 13.52% respondents had no idea about the course and just opted out of curiosity to discover and know what the course dealt with. (table-1)

Table 1. Need for opting credit course

Need for studying this course	2012	2011	2010	2009	2008	2007	Total/ %
Learn about retrieval techniques & Information Sources	7	1	6	6	6	5	31 (41.89%)
Skill in Information search & research work	4	5	4	8	5	7	33 (44.59%)
Out of curiosity	2	0	2	2	3	1	10 (13.52%)
total	13	6	12	16	14	13	74 (100%)

Role of Advisors

In order to know students views on who advised them to study this course, as the course was optional and not mandatory, Some 35% students felt that they advised them selves in discussion with senior students. It is interesting to learn that students discussed choice of courses among themselves and considered the nature of course, its contents and the benefit they could achieve as important. More than 55 % students stated that they were advised by their advisors to opt for this course. The role advisors at G B Pant University of Agriculture & Technology is important in guiding and mentoring of all students in their overall academic performance.

Table 2. Advisor for the Course (Storage & retrieval of scientific information)

Advising	2012	2011	2010	2009	2008	2007	Total/%
Self advised in discussion with senior students.	3	2	2	8	5	6	26 (35.13%)
Advised by advisors	9	2	10	6	8	6	41 (55.41%)
Out of curiosity	1	2	0	2	1	1	7 (09.46%)
total	13	6	12	16	14	13	74 (100%)

Department wise attribution

To assess department wise students showing interest in this course over the period of six years, it is noted that out of 74 respondents the upmost number of students 30 (40.54%) opted the course from Seed Science and Horticulture. As noted above, that advisors play a significant role in advising the students on various courses they could prefer or select for. Under many situation considering the capacity of the students and the credit load they can take, advisors generally recommend their advisees to discuss with senior students on what the course (storage & retrieval of scientific information) deals with and how it could help them their research studies or writing a dissertation or a project report. It appears that this could be one the reason for the differences in number of students opting for the credit bearing information literacy course from various departments.

Table 3. Graduate students opting course departments wise

Departments	2012	2011	2010	2009	2008	2007	Total/ %
Horticulture	2	6	7	5	4	6	30 (40.54%)
Vegetable Science	3	0	0	6	2	3	14 (18.91%)
Seed Science	8	0	5	5	8	4	30 (40.54%)
total	13	6	12	16	14	13	74 (100%)

Frequency of library Usage

It was felt important to know how often the students visited or used the library for information seeking, the feed back was quite encouraging with highly significant more than 85.% visiting the library several times a week. Ten percent students stated that they consulted the library only once a week. The frequent use of library was expected as the graduate students are likely to be more dependant on library and learning resources for their research and scholarly activities besides other assignments.

Table 4. Frequency of Library Use

Frequency of library use	2012	2011	2010	2009	2008	2007	Total
Several times a week	10	6	9	15	12	11	63 (85.13%)
Once a week	2	-	1	1	2	2	8 (10.81%)
Once a month	1	-	2	-	-	-	3 (4.05%)
total	13	6	12	16	14	13	74 (100%)

Knowledge of Library catalogue/OPAC

In order to understand the graduate students knowledge about use of local library catalogue / OPAC and how they learnt, a question was posed if they had used the library catalogue and how

they learnt it. The responses were promising, close to 60% (precisely 59.45%) students perceived themselves of having knowledge of library catalogue, but how they learnt it, was somewhat unusual, instead of learning by the guidance of a staff from library most of the students approximately 28.38% stated of having learnt it from senior students and friends. Twenty nine students stated that they had no idea about library catalogues. It is also interesting to find that students learnt the use of catalogue from friends and senior students. Seventeen percent students felt that they learnt use of catalogue by trial and error. Few students around 12.% approached or took guidance and help of information professionals or staff to know about using catalogue /OPAC. Though the university conducts library orientation at the beginning of the semester it's not enough to teach the students on skills of using library catalogue. The figures 17.56% on learning use of catalogue by trial and error was certainly not expected and is disappointing. The situation can be attributed to the fact that most graduate students comes from different colleges across the Uttrakhand a state through entrance test and perhaps did not have access to well organized library resources, besides the fact that many college libraries are understaffed and lack sufficient learning resources, a fact unlikely to be ignored. In addition, the geographical situation of the state comprises high mountainous regions with several remote locations lacking reasonable resources could also be attributed to the present situation.

Table 5 Knowledge about Library catalogue /OPAC and how they Learnt

Library catalogue /OPAC	2012	2011	2010	2009	2008	2007	Total
Knowledge about Library catalogue							
Yes	5	5	6	13	9	7	44 (59.45%)
No	8	1	6	3	5	6	30 (40.54%)
Learning method							
i.) Help of Senior students friends	2	4	3	5	4	3	21(28.38%)
ii.) Support of Library staff	2	-	-	4	2	1	09(12.16%)
iii.) Trial & error	1	1	3	3	3	2	13(17.57%)
iv) Teachers	-	-	-	1	0	1	02 (2.70%)
v) Do not know	8	1	6	3	5	6	29(39.19 %)
Total	13	6	12	16	14	13	74 (100%)

Arrangement of Books, Interpreting Call numbers

The students were also questioned if they had knowledge about arrangement of books in library and their ability to identify the catalogue information required to locate physical items of library (table 6) less than 36% students felt that they knew about arrangement of books and perceived it to be subject wise. When further questioned on their knowledge about call number, book number and collection number which plays an important role in retrieval, majority of the students found it problematic, over 80% stated that they unaware of these numbers that were helpful in locating physical materials from library. Some student's approx 17.57% felt that they knew about call numbers which they perhaps learnt from their senior friends or existing class fellows. It is worth

stressing here that such a large percentage of students not knowing about arrangement of books and skills for retrieving physical documents calls to the attention of information professionals and their proactive guidance which cannot be met by orientation alone. Therefore, the role of teacher librarians requires to be more focused and proactive to reach students rather than expecting them to come to librarians for assistance.

Table: 6 Knowledge about arrangement of books

Arrangement of Books	2012	2011	2010	2009	2008	2007	Total
1.Knowledge on arrangement of Books in library							
Yes	6	4	5	4	3	4	26 (35.14%)
No	7	2	7	12	11	9	48 (64.86%)
2.How they are arranged							
Subject	5	4	-	4	3	4	20 (27.02%)
No idea	7	2	7	12	11	9	48 (64.86%)
Title	1	-	4	-	-	-	05 (06.76%)
Author	-	-	1	-	-	-	01 (01.35%)
3.Knowledge about call No book No & Collection No.							
Yes	3	1	2	3	2	2	13 (17.57%)
No	10	5	10	13	12	11	61 (82.43%)

Bibliographical databases

A question on bibliographical database was included in the questionnaire to know if the graduate students knew about databases and formulating search strategies or limit search results , as expected very few, less than 10% respondent knew about CD or offline databases and large no of students 90%   were not familiar of it and perhaps used it for the first time. The students who perceived them selves about knowing databases had already used CAB abstract database and perhaps learnt from their senior class fellows. A large number of students admitted of not knowing the search strategies like truncation, use of Boolean logic, (And Or Not) etc., narrowing topics or subjects searches for finding relevant information. Those who had understanding, perhaps leant from their earlier studies most likely science classes or senior class fellows on their own.

Table 7. Knowledge about bibliographical databases

Bibliographical databases	2012	2011	2010	2009	2008	2007	Total
1. Knowledge about bibliographical Database/ database on CDs							
Yes	-	-	-	3	2	2	7 (9.45%)
No	13	6	12	13	12	11	67 (90.54%)
2. If yes what database was used?	-	-	-	3	2	2	

	2012	2011	2010	2009	2008	2007	Total
CAB Abstract							7 (9.45%)
3.Knowledge on database search & search Strategies.							
Yes (Boolean logic)	-	-	-	3	2	2	7 (9.45%)
No	13	6	12	14	12	10	67 (90.54%)

Popular Search engines

Questions were posed to know Graduate students knowledge about search engines and its use, Significantly outnumbered, more than 80% students knew about Google and Yahoo search engines and used it for searching academic material. The figures also indicates the popularity of these sites among students. Regarding search of scholarly literature the figures are unusual but as anticipated by author to find that very few students, less than 14 % had knowledge about Goggle scholar which is better and enhanced search engine for locating scholarly material . The finding indicates that further awareness need to be made about popular search engines available for surfing academic materials for research and supplemental learning besides class room teaching. The skills to identify, evaluate and retrieve information effectively need to be developed for successful use of electronic resources available across several websites over internet and in-house learning resources. .

Table 8. Knowledge about search engines

Knowledge on search engines	2012	2011	2010	2009	2008	2007	Total
Knowledge about search engines.							
Yes	12	5	10	10	11	12	60 (81.08%)
No	1	1	2	6	3	1	14 (18.92%)
Search engine used to search academic Material.							
Google & Yahoo	8	2	2	9	9	7	37 (50.00%)
Google	4	3	8	1	2	5	23 (31.10%)
No	1	1	2	6	3	1	14 (18.90%)
Do you know about "Google Scholar"							
Yes	4	1	4	1	0	0	10 (13.51%)
No	9	5	8	15	14	13	64 (86.49%)

Abstracting and Indexing Periodicals

Students' awareness on abstracting, indexing periodicals and citation databases like web of sciences or Scopus was also questioned, as per authors understanding or hypothesis a large number of respondent were unaware of these academic materials, and also about one of the most popular periodical "the current content ". The figures and responses are in confirmation as indicated in this study. Less than 6% students stated of knowing about periodical like current content or citation databases. The question on importance of these periodicals or databases was skipped apprehending

unsatisfactory understanding about these information resources. The deficient situation may be attributed to the fact that students graduating colleges perhaps did not subscribe to these periodicals or databases, high cost of subscription could be one of the factor or they never felt the need to use these periodicals in their under graduate studies. Those who responded were graduates from G B Pant University of Agriculture & Technology, and had access to well developed library and learning resources.

Table 9. Abstracting and indexing periodicals

Abstracting and Indexing	2012	2011	2010	2009	2008	2007	Total
Knowledge of abstracting & indexing Periodical and citation databases (current content/web of science /Scopus) Yes No	. 0 13	0 6	0 12	2 14	1 13	1 12	4 (5.40%) 70 (94.60%)
Total	13	6	12	16	14	13	74 (100%)

Subject gateways and Library Websites

To examine students awareness towards subject gateways and use of library website the figures indicated in table 10 are disappointing. Non of the graduate students perceived them selves of knowing about subject gateways though they were using search engines like yahoo and Google for searching academic material. Less than 13% students acknowledged of using library website. When questioned about the kind of information they found in the website most stated about library collections, rules and regulation, period of loans etc. It is upsetting to note that graduate students did not use OPAC and other links to e-resources available in library website. The situation is most likely attributed to a slow internet connection or band width at the college campus .Also not very prominent and attractive links to e-resources find place in library website, in addition the site is yet to incorporate many interactive user friendly features, most of the information is in static format . The finding indicates that there is notable gap in students' knowledge and perception about use of library website. The use of library website need to be popularized extensively among the students and is a challenging task for the library and faculty both.

Table 10. Subject Gateways and library website

Subject gateway /library websites	2012	2011	2010	2009	2008	2007	Total

Knowledge about subject gateways							
Yes	0	0	0	0	0	0	0
No				16	14	13	43 (100%)
Use of university library Web site							
Yes	2	1	2	2	1	1	9 (12.16%)
No	11	5	10	14	13	12	65(87.84%)
Information found in library website							
Library collection /rules	1	-	1	2	1	1	6 (8.10%)
Academic information	1	1	1	-	-	-	3 (4.06 %)

Acquiring Latest developments in Subjects

Table 11 indicates how students informed themselves about latest developments or updated themselves in their subject field. It is inspiring to know that upmost more than 30%. students depended on internet resources to update themselves in their respective disciplines. Many respondent about 28% showed preference to printed journals, still to acquire the latest development/information in their respective disciplines. A little more than 10% respondents used the internet and bibliographical database followed by more than 15% students using journals imprint and internet both. The study reveals that while internet resources were most popular among students the use of journal in print was considered equally important. The responses from graduate students reveals that while internet resources are important it cannot replace the use of physical sources completely.

Table 11. Information about new developments in Subject

New Developments	2012	2011	2010	2009	2008	2007	Total
i. Journals in print	5	1	3	5	3	4	21 (28.37%)
ii. Exchange of information from other students and journals	-	-	4	2	1	1	8 (10.81%)
iii. From Internet	4	4	3	5	4	4	24 (32.43%)
iv. Internet & bibliographical data base	1	-	-	3	3	2	9 (12.16%)
v. Journals imprint and internet	3	1	2	1	3	2	6 (16.22%)
total	13	6	12	16	14	13	74 (100%)

Tools and Sources used for searching Scholarly information

Graduate students are likely to depend greater on library and learning resources for their academic

assignment and research work. Therefore, a question was posed to know what sources and retrieval tools they used to search information on specific topic, most positively and significant, 47% respondent felt that they located and acquired information by using popular search engines like Google or Yahoo, already popular sites among graduate students. Less than 20% students stated to use library catalogue along with web search engines for scholarly literature. Close to 15 %
students agreed to use bibliographical offline databases and search engines both to search academic materials related to their research and academic assignment. The figures are suggestive of a trend, of blended or mixed searches involving both web based and in-house materials, but greater dependency on seems to be on web search engines.

Table 12.   Tools / Sources used for searching specific topic for research / thesis

Tools and sources	2012	2011	2010	2009	2008	2007	total
Web Search engines (Yahoo/Google)	8	4	9	6	4	4	35 (47.29%)
Search engines and library catalogue	2	1	2	3	2	3	13 (17.57%)
Library catalogue/OPAC	1	-	-	2	1	1	05 (6.76%)
Bibliographical database (CAB)	0	-	-	2	2	2	06 (8.10%)
Bibliographical database and search engines.	0	-	-	3	5	3	11 (14.87%)
Others	2	1	1	-	-	-	04 (5.40%)
total	13	6	12	16	14	13	74 (100%)

Library Networks

Students were also questioned to know if they had ever used any library networks for example Indian, Information and Library Network (INFLIBNET), Developing Library Network (DELNET), or OCLC-worldcat. The figures reveals that upmost highly significant close to 90% students had no knowledge about library networks, what so ever national or international . It is not difficult to understand the situation considering their limited knowledge on electronic resources as indicated by their responses to statements above. This highlights the concern for the LIS professional on limited awareness that graduate students have about various sources of online information and their limitations on information competency skills.

Table 13. Knowledge of library networks

Library networks	2012	2011	2010	2009	2008	2007	total

Knowledge of library networks Like INFLIBNET, DELNET, OCLC etc.							
Yes	2	1	4	1	0	0	8 (10.81%)
No	11	5	8	15	14	13	66 (89.19%)
total	13	6	12	16	14	13	74 (100%)

Advise on Library news and Learning resources

To know how the students would like to be advised by the library on latest information sources and news (table 14) upmost students close to 45% preferred to be advised and informed though library website and e-mails, regardless of not being active or promising users of library websites. The fact to be noted here is though few students stated of using website of library, still the highest wished to be informed about current learning resources through library website or email, perhaps being convenient and having easy accessibility. Twenty percent students preferred to be guided or informed by printed handouts. Less than 15% students expressed their interest on being advised and informed about library resources by orientation and presentations. Interestingly 8% students wished to be informed by personal talk, with reference to help desk staff.

Table 14. To be advised and informed about library news and learning resources

About Library news	2012	2011	2010	2009	2008	2007	total
Printed handout	3	4	2	3	2	1	15 (20.28%)
Library help desk	1	-	1	1	1	2	6 (8.10%)
Library website /e mails	7	1	6	8	6	5	33 (44.59%)
Library orientation /presentation	1	1	3	1	2	3	11 (14.86%)
Tutorials	1	-	-	3	3	2	9 (12.16%)
total	13	6	12	16	14	13	74 (100%)

Notable Findings and Overview

The findings of this study indicated through views of graduate students suggests the following.

1. Students interest on opting the one credit course Storage and Retrieval of Scientific Information, reveals that most graduate students close to 45% wanted to learn about various skills in information search to help them selves in their research management and scholarly assignments. More than 40% students were keen on learning retrieval techniques and myriad sources of information.

2. Upmost 35% of graduate students felt that they advised them selves in discussion with senior students to study the credit bearing course on user education and information literacy. Fifty five percent of students stated that they were advised by their advisors to opt for the course. *The advisors at G B Pant university of Agriculture & Technology play an important role in guiding and mentoring the students in their entire period of study.*

3. Students across three disciplines studying the course indicated that 40% students studied the course from Seed Sciences and equal no. students from Horticultural sciences. Less than   20% students from Vegetable sciences opted the course. Advisors play an important role in advising the students on the various courses they could choose from. *The course "Storage and Retrieval of Scientific Information" is optional. Therefore student's interest in the course as well as the advisors role and their advices have been quite encouraging.*

4.Graduate students' knowledge on use of library catalogue / OPAC and how they learnt, is promising, a significant 59 % students perceived themselves of having some knowledge of library catalogue and were able to interpret location information to some extent, but their method of learning was notable, instead of using reference librarian's guidance, more than 28% student learnt from senior students and friends. It is unusual but interesting to find that more than 15% of students learnt the use of catalogue by trial and error. Thirty nine percent students stated of having no knowledge of library catalogue. *The study reveals that few students precisely 12% approached or took guidance and help of an information professionals to know about using catalogue /OPAC. Though the university conducts orientation its not enough to teach the students on skills of using catalogue to locate information.*

5. Students lack knowledge about arrangement of physical learning resources in library, less than 26% students felt that they knew about arrangement of books and perceived the arrangement as subject wise. Their knowledge about ability to read a call number, involving book number and collection number was insignificant, majority of the students more than 80% stated that they were not aware of such numbering system. Only 7 (16.27%) students felt that they knew about call numbers which they learnt from their senior friends and class fellows. *The situation demands attention of LIS professionals and their guidance which cannot be met by orientation alone. Therefore, teaching credit courses on user education and information literacy is required for all graduate students.*

6. Knowledge about offline or CD databases and search techniques, as expected was inadequate only less than 10% students had knowledge about databases. Large no of students comprising, 90% admitted of being unfamiliar with databases or its features . Few students who perceived them selves about knowing database had already used popular CAB abstracting database and learnt from their senior class fellows. A significant number of students admitted of not knowing the search strategies like use of Boolean logic, or narrowing topics for finding scholarly information.

7. As high as high as 81% students were familiar with Google and Yahoo search engines and used it for searching academic material. Less than 14% of graduate students had knowledge about Google scholar. *The finding indicates that students need to be made aware about popular search engines available for searching academic materials for their research and scholarly work. Besides*

their skills to find and retrieve information effectively need to be developed for successful use of electronic resources available across several websites over internet as well as in-house resources.

8. Most graduate students were unaware about abstracting, indexing periodicals or citation databases like Web of science or Scopus . Only 6% students stated of knowing periodical like current content. *The situation can be attributed to the fact that students graduating from different state colleges perhaps did not subscribe to such periodicals or they never felt the need to use these periodicals in their under graduate courses. Those who responded of knowing were graduates of G B Pant University of Agriculture & Technology , and had access to well developed library and learning resources.*

9. The study indicates that no students admitted of having knowledge about subject gateways, or portals though they were using search engines like Yahoo and Google for searching academic material. Very few only 12% students used library website, and stated of finding information on library collections, rules and regulations, period of loans etc. they had not used OPAC and other e-resources available from library website. S*low internet connectivity and lower band width besides not very prominent and attractive links given to e-resources in library website are possible reasons. The findings indicates that there is notable gap in students' knowledge and perception about use of library website. The use of library website need to be popularized further among the students.*

10. To know latest developments in respective disciplines more than 30% graduate students depended on internet resources. More than 28% student's preferred printed journals to know the latest development in their subject field. Less than 13% percent of respondents used both search engines and bibliographical databases to inform themselves. Sixteen percentage students stated of using journals in print and internet resources both. *The study reveals that while internet resources were popular among students the use of journal in print was considered equally important and therefore Internet resources does not seem to replace journal in print .*

11. Large number of graduate students comprising 89% were not familiar with   Library networks or world cat what so ever, for example national networks like INFLIBNET, DELNET or international OCLC. *This highlights a concern for the LIS professionals that limited awareness of students on sources of web information and limited information seeking skills calls for greater commitment and their involvement towards IL programs .*

12. A significant 44% of graduate students preferred to be advised and informed about library news and current learning resources though library website and e-mails. Less than 15% expressed their interest on library orientation and presentation. About 20% students just next to library website or email desired to be informed by conventional printed handouts. Few students comprising 8% wished to be advised in personal talk with preferred help desk staff. *Though few students stated   of using website of library yet the highest wished to be advised through information on library website or email being convenient and faster.*

Conclusions

This study into users perception and their skills on information competency reveals that there are notable gapes in the knowledge of agricultural science graduate students on various information seeking skills, for example use of OPAC or library catalogue and interpreting call numbers, web search engines like Google scholar, bibliographical data bases, library web site etc. Their skills on identifying, interpreting, evaluating and accessing information needs to be developed and enhanced. These gapes can be bridged better by teaching credit bearing courses rather than orientation alone. It is noted from students responses that most of them used the internet resources and search engines like Google to search scholarly material, indicating greater emerging reliance upon electronic information sources. This calls upon LIS professionals to train students in information competency or skills. Creating awareness on myriad information sources cannot be met by library orientation alone, therefore, credit bearing course which is being offered in present optional form needs to be made mandatory for all graduate students. Evans (22) asserts that in higher education 'integrating teaching, learning and technology is a mandate, not an option, and doing any less would border on professional irresponsibility'.

To better understand the students information literacy skills in Indian situation wider perspective and more systematic and wide spread survey is required to understand the situation in other universities.

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