

# **Embedded Information Literacy for Engaging Students in Higher Education : An Assessment of Indian Agricultural Universities and Trends**

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## **Introduction**

Information literacy has been trending for quite some time, and has been a focused area of research in the 21<sup>st</sup> century for promoting lifelong learning and raising information literate individuals for an informed society. UNESCO's Intergovernmental Council for the Information for All Programme in 2006 established a Working Group on "Measurement for Knowledge Societies", with a special focus on three priority areas, namely Information Literacy, Information Preservation, and Information Ethics, all three of them with critical importance to the development of knowledge societies.

Information Literacy is the stepping stone in the creation of a knowledge society in a larger way. Although IL skill development is not library-centric and can be provided through several other channels, libraries continue to be an important place, being a hub of knowledge and information, it plays the most important role in providing information skills to the student community in an organized way by formal channels of education and by incorporating it into academic programs through a credit system.

Information Literacy has been a subject of discussion in many educational circles worldwide and continues to be an important skill for students in higher education. In order to handle issues of information overload and rapid growth of information, and the ability to locate and evaluate authentic information for critical thinking and problem solving, information skills are crucial for the student community. Higher education involves research assignment which is essential for completing academic and research assignments. Ariel Rodriguez (2005), states that the ability to evaluate research could be more important than the ability to conduct research. Information literacy provided through formal channels enhances the information skills of students and helps them to be more confident in dealing with information and research material. King (2007), reports that Students without these crucial skills will find it difficult to cope successfully with their academic courses or eventually measure up to the demand of employers.

Researches in the recent past indicate a diverse understanding of information literacy in higher education, for example, ALA (1989) states set of abilities requiring individuals to recognize when information is needed and have the ability to locate, evaluate and use effectively the needed information. ACRL (2000) states in their information literacy competency standing for higher education that developing lifelong learners is central to the mission of higher education. In Indian higher education system for Agricultural and allied sciences, User education existed from 1970's through integrated course curriculums. These courses in Agricultural universities of India had its beginning from the pattern of land grant colleges of American universities. The US land-grant universities assisted India in the generation of new technologies that led to the green revolution in the 1960s and many state agriculture universities such as G B Pant University

of Agriculture and Technology, Punjab Agriculture University and others were modeled after the US system. SPAN (2007). Indian agricultural universities having roots from these colleges accepted the land grant pattern of imparting education with trinity functions of teaching, research, and extension establishing a relationship between agricultural colleges, research departments, and extension services.

The country, post-independence had myriad challenges and one was to bring reforms in agriculture and food production. When the country was facing food crises and required sustainable food security the existing Agricultural education and research had to be reorganized to meet the challenges of economic progress and change, Randhwa (1968). The objective was to deliver the best agricultural education and to develop high yielding varieties to boost green revolution in the country. The education system was reoriented largely recognizing the weakness in the existing system. In the process of transformation and reorientation, it was realized later that students entering higher education lacked capabilities in the use of information and learning sources. After much discussions and deliberations in academic forums, information literacy or information competency skills for graduate students was considered mandatory by the academic councils of many state agricultural universities, it was made an essential part of the curricula for graduates who are likely to be much more dependent on learning resources for their research projects and coursework. However, undergraduates were left with bare orientation and demonstration to library resources and facilities and guidance from reference librarians. The postgraduate courses were ideally designed and structured to teach students the necessary skills to identify and evaluate learning resources, and also develop their information skills for lifelong learning.

This study addresses IL programs of Agricultural universities in present /changing context, examines trends in restructuring teaching content and uniformity of courses across the country. In recent years Information Literacy has been a gaining popularity and has been widely discussed among Indian information professionals and librarians. The significance and relevance of information literacy have been greatly recognized by various prominent library association like ACRL, ALA, Council of Australian University Librarians (CAUL) etc. Paradigm changes in libraries and growing digital resources/digital contents are replacing the conventional information sources. The changing scenario has posed challenges for information professionals to enhance the information skills of patrons to empower them to exploit the digital or hi-tech libraries that are being pushed to them. The patrons need to be competent enough to find and analyze vast ocean of information sources, evaluate, as per their requirements and be able to use on their own, and, most importantly survive in a digital world of information.

## **Research Reviewed**

Many studies in Information Literacy have been reported from time to time. Some very early studies in information literacy are by Zurkowski, (1974) he used the term information skills to refer to a person who is able to solve information problems by using relevant information sources and applying relevant technology. Parrish (1989) states that of library services through orientation programs had low impact and reported low attendance. Roth (1999) explained information competence assessment initiatives at several universities in California, in her study

at California state university, San Marcos she measured student's attainment in Information Literacy over a period of four years.

Piette and Dance (1993) found that tailored Information Literacy programs for students had more positive responses and fill 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 the online catalog and to identify journal article less than 35% could distinguish between citation to a book and one to the journal article.

A steady rise of interest in information literacy resulted in the publication of more than 5000 articles on the subject by the year 2002 of which over 300 were published in 2002 alone, Rader H.B (2002) many more studies were taken up by librarians and information specialists later on, and the subject continues to get the attention of the researchers and their involvement in Information Literacy.

Some of the later 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 and 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, evaluating sources of information and discussing how to conduct a literature review. Chrzastowsk and Joseph (2006) and Jankowska et al. (2006) reported that graduate students primarily use journal articles rather than books, they preferred electronic access and cross-database searching. The students, like many information seekers, learn about library and their information needs from their peer group, once they realize that advice from their fellow peers is not sufficient in fulfilling their information requirements they prefer a personal library liaison or information literacy program for guidance 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. The workshop is independent of curriculum-based course, so they can be targeted towards a 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 copyright issues, a concept like student's responsibilities as future faculties etc.

Brasely and Sterling (2008) stressed the role of librarians and discipline faculty collaborative models for integrating IL beyond the one-dimensional definition of Information Literacy. They emphasized that students being future citizens should be equipped to handle multidimensional facets of information, for example, the economic, social, cultural, technical and ethical demands of information and this call to action the educators. The authors have described a framework for collaboration between librarian and discipline faculty for multidimensional IL development and infusion. Rempel and Davidson (2008) on providing IL to graduate students through the

Literature Review Workshop found that graduate students responded well to conference-style environment and actively participated in a 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 the 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. Harrington Marini (2009) investigating on how psychology students find information for coursework and research in University of Western Ontario, indicated that graduate students were comfortable in using libraries, preferred electronic resources and had interest in furthering their information literacy knowledge. The authors suggest, 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 Indian agricultural universities provided credit-bearing information Literacy courses to Graduate students and some universities to Ph.D. students and focused on teaching library skills blended with research and scientific writing. A more recent study by Price, Beker, Lynette, and Collins (2011) on embedding IL in the 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.

Wilder (2013) on IL and library instruction argues that while library instruction is properly grounded in disciplinary norms, information literacy serves a vital institutional obligation as a means of assessing student learning. The content of library instruction thus serves the University's "vertical" disciplinary agendas, while information literacy serves its "horizontal" institution. Agyekum, B.O, Ntiamoah, SK and Arthur B (2017) analyzing the information literacy programs in technical university libraries in Ghana finds that majority of the libraries included IL classes as part of their IL programs, and these were delivered face to face and through online tutorials. Lack of integration of Information Literacy into the regular curriculums of technical universities has been found to be a barrier to effective IL programs.

In India some of the study that assessed information literacy skills of students' community include; Singh N (2014) on assessment of IL skills of Indian Agricultural Graduate students at G B Pant University stated that there are notable gaps in knowledge of students on various information seeking skills precisely on use of OPAC or library catalog and interpreting call numbers, using web search engines like Google Scholar, bibliographical databases, and library websites etc. Responses from students also demonstrated that most of them used internet resources to search scholarly material indicating greater emerging reliance upon electronic information sources.

Assessing IL competence among the undergraduate students of college of agriculture in Raichur, Karnataka, Hadimani M.B and Rajgoli I.U (2010) highlights that majority of the students had the ability to recognize and locate information, but they lacked competence in extracting online information, copyright laws, and institutional policies related to the access and use of information sources. Bavakutty and Nasrudheen (2008) reported that a good number of science research students face problems in formatting references and URL address, the number of non-science students facing these problems is comparatively less. Many science research students and a little more than half of the non-science research students are familiar with any of the citation

styles such as MLA, APA, and Chicago. It is also noted that more than half the number of research students are not able to identify the right key-words of research papers and journal articles. It is to be appreciated that a large majority of research students (90%) are concerned about the quality of information they receive. The author stresses that IL programs be taken up at Kerala University not for one time in a year but on a continuous basis. Sharma Y (2010) analyzing IL of patron of Punjab Agricultural University, found that majority of users was able to access, use and organize information, however, it was strongly felt that collaborative approach of librarians and teachers must be encouraged to improve Information Literacy.

Uniyal and Kaur (2018) in their study on the need of media Information Literacy pedagogy in Indian Institutes of Technology found that more than 25% students desired curriculum based regular IL and more than 65% students believed media IL would enhance their critical thinking abilities for evaluating media messages.

Though a number of studies have been accomplished on IL of students through orientation programs, lectures, practical hands-on Information retrieval, and other tools through informal methods. Few studies in India have focused on IL through embedded formal education and credit courses. This study evaluates the changing trends and the existing information literacy programs offered to the student community through formal educational channels across Indian agricultural universities.

## **Objectives**

This article set forth the following objectives to discuss broadly the information literacy programs /courses followed by the Indian Agricultural Universities and

- (1) To report what the agricultural universities are doing to enhance students' information literacy skills when world academic librarians are faced with digital resources, e-learning, online courseware and blended learning in changing context.
- (2) To identify the courses taught at the 34 universities studied and how these have changed after the National Core Group of ICAR centralized the basic courses.
- (3) To examines the faculty /librarians who teach Information Literacy courses in agricultural universities.
- (4) To evaluate the situation of Information literacy for undergraduate students.

## **Purpose of Study, Limitations, and Methods**

The programs of information literacy offered by libraries of 34 Indian Agricultural university libraries across the country are examined and analyzed. The bibliographical details of universities were collected from the website, ([www.icar.org](http://www.icar.org)) of Indian Council of Agricultural Research (ICAR). The data have been collected from a brief questionnaire, some of the research questions were, does library offer IL courses to students and at what level, whether the course is integrated into regular curriculum, is it compulsory or optional, was the course changed after the new ICAR guidelines and adopted. What innovative methods were used for teaching? etc. A close examination of documentary sources and relevant websites of libraries linked to the agricultural universities were also made. These were analyzed and evaluated from the period of January 2013

to December 2018 to find examples of Information literacy programs provided by Indian agricultural libraries . The librarians and teacher librarians were also extended e-mails to know details of course description and to understand some of the contents that were not clearly indicated and explained in their respective home pages. Terms like Information Centers, Libraries and Learning Resources Centers are used interchangeably. Like most studies this study also has some limitations, it covers 34 state agricultural university out of 47 universities including one central university and a Deemed University<sup>1</sup> (IARI) while excluding areas like Veterinary, Dairy and Fisheries universities and institutes like Indian Veterinary Research Institute (IVRI), National Dairy Research Institute (NDRI), and Central Institute of Fisheries Education (CIFE) respectively.

## **Analysis of Findings**

With emergence and popularity of electronic resources, besides increasing focus on digital libraries, information literacy has been receiving utmost attention among the Indian professional practice. As early as 1970's, user instruction existed in many Indian agricultural universities and were adapted from land Grant pattern of American universities. Popularly known as user instruction or user education, most agricultural universities had an embedded curriculum approach to enhance students' information and research skills.

This study examines and reports on what Indian agricultural universities are offering to enhance their students' information competency skills in present situation when education sector is witnessing a remarkable change in terms of e-learning, online courseware's and blended teaching methods. In addition, the study also identifies areas like basic contents in terms of latest developments, library skills, and research skills, latest developments, etc to bring uniformity in course contents across all agricultural universities.

As interest in Information Literacy continues to build upon, scholarly discussions began in 2009 to evolve Indian Agricultural education in tune with the changing national and international scenarios owing to new cutting-edge technologies, improved tools for content delivery using information and communication technologies, besides globalization of education. After the green revolution in India that introduced high yielding varieties, and modern farming methods in 1968 the Indian agricultural scenario has seen a phenomenal stride over the period of 50 years. Past few years have seen a decline in overall agricultural growth rate and there has been a stagnation in reserve food stocks. Great challenges continue to exist for Indian agricultural community to ensure sustained food security to the growing Indian population at one hand and to enable all farmers and agro-industries to become strong enough to face global competition. (NAIP Report, 2009-2010)

Stagnancy and lack of innovation in Agricultural research have been a topic of deliberation in agricultural academic and research circles in recent years. It is being realized that strategic modifications in the academic and research sectors are required that is capable of addressing broader horizon of all components in higher education and research, in agricultural and allied

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<sup>1</sup> An Institution of Higher Education, other than universities, working at a very high standard in the specific area of study, can be declared by the Central Government on the advice of the UGC as an Institution 'Deemed-to-be-university'. Institutions that are 'deemed-to-be-university' enjoy academic status and privileges of a university. <http://mhrd.gov.in/deemed-university>

sciences to manage innovations and changing trends. The Indian Council of Agricultural Research (ICAR), the apex body responsible for coordinating and managing research and education besides funding SAU and ICAR research institutes took the task of restructuring the postgraduates (master's and doctoral) course curriculums and syllabi of Agricultural and allied sciences at national level by constituting a National Core Group (NCG) of 12 academicians for restructuring the postgraduate course contents.

While restructuring postgraduate courses by ICAR, it was identified to ensure a uniform system of education following a Common Academic Regulations (CAR) across the country. Under these guidelines, the Information literacy courses that were offered by several universities by different course contents and course title got changed and was replaced by a common course called *Library and Information Services* with code No. PGS-501. Table 1 in appendix highlights the improvised and previous course programs offered across Indian agricultural universities in the country. The data has been analyzed as below; under prior information literacy; the changes and trends; teaching IL and Information Literacy opportunities for undergraduates.

## **Early Information Literacy**

The findings reveal that out of 34 universities surveyed significantly higher 90% offer IL as indicated in table-1 through curriculum approach to Graduate students and Ph.D. students by different names, to mention a few like ‘*Scientific Information and Retrieval Techniques*’, *Literature and Technical Writing*, *Storage and Retrieval of Scientific Information*” and recently incorporated the “*Library and Information Services*” recommended by the National Core Group of ICAR for restructuring the postgraduate course curricula of Agricultural and allied sciences.

Indira Gandhi Krishi University, Raipur was the first university to start a course “*Biological Literature and reference work*” way back in 1970 that was subsequently followed by other states Agriculture Universities in India, for example G B Pant University of Agriculture & Technology (GBPUAT) by the title *Storage and Retrieval of Scientific Information* in 1976 and *Scientific Report Writing* in 1977 by Marathwada Agriculture University, Maharashtra in Western India. The Uttarakhand University of Horticulture & Forestry has been the most recent to start Information Literacy - *Scientific Information and Retrieval Techniques* in the year 2012.

Many state universities, prior to 2010, for example, PAU, N.G Ranga Agricultural University, HAU, UAS Bangalore were offering a blend of library and Information sciences focused to User skills, Technical writing, and Research skills. While library and information sciences topics centered around topics like the type of library its functions, knowledge classifications, use of catalog OPAC, sources of information, formulating search strategies, databases preparation of bibliographies, citation writing etc. The focus of technical writing was on preparing scientific reports, technical jargons like footnotes, proof readings etc. while some universities emphasized more on research skills and technical writing others gave extensive importance to Library and Information Sciences content focused on enhancing students’ information competence. It was noted that combining two important topics into one course was somewhat unusual, the author in one of her researches Singh, N (2006) identified and suggested that as libraries are getting hi-tech and complex in nature with e-resources, WEBOPAC, access to database etc. an exclusive

separate credit course should be offered for information retrieval and library use. Technical writing that is, equally important, may be separated to be offered by language and communication department of respective universities.

## **Reorienting IL, Changes, and Trends**

The National Core Group (NCG 2009) of Indian Council of Agricultural Research responsible for restructuring the course contents of various agriculture universities realized the situation of IL, discussed above, in the year 2009-2010 and deliberated for revamping the previous course structure. Six essential noncredit courses were recommended out of these two were Library and Information Services coded PGS-501, and Technical Writing and Communication skills PGS-502. These are essential for completion of masters' programs, the research students working for doctoral studies have been exempted if they have already studied at master's level.

Table 1 in Annexure indicates successive new course which is compulsory and non-credit based as per ICAR guidelines and the previous course titles. The trend of introducing Information Literacy as a noncredit course is encouraging and has been mandated by the Indian Council of Agricultural Research (ICAR) to advance and refine agricultural education across the country. ICAR rightfully recognized the need to train and provide information competency skills to the student community. Many state university authorities that were not convinced on offering IL through coursework are now more open to incorporating it in their regular academic programs. The National Core group of ICAR got 90% of the universities to adopt new course structure due to the rationale that ICAR provides major funding and development grants to state universities and these funding have been incentives for them to incorporate the changes and to bring uniformity in teachings Information Literacy across the country.

The new course (Education Division ICAR 2009 & LUVAS) centers around more or similar updated course content from previous courses covering topics such as role of libraries in education, research and technology transfer, sources of information, intricacies of abstracting and indexing services, reference sources, citation tools and techniques, literature surveys and bibliographies. Use of electronic information resources and databases, formulate search strategies, OPACS including Internet resources and search engines.

A close look at the table reveals that when more than 60% of the universities were offering IL previously at master's level and Ph.D., some 20 % universities, for example, Orissa University of Agriculture & Technology, (OUAT) Orissa; Biden Chandra Krishi Vishvidlaya, West Bengal; Sardar Patel University of Agriculture & Technology and Chandra Shekhar Azad University of Agriculture & Technology, Uttar Pradesh etc. did not have any course for skilling students on Information Literacy. After formulation of common academic regulations by ICAR, these universities incorporated the imperative non-credit course entitled Library and Information Services (PGS-501) from the academic year 2010 onwards.

The Information Literacy courses offered earlier were largely credit based and were graded in the semester final examination, the present course is replaced by a mandatory non-credit course for completion of all master's or post-graduate programs in Agricultural and allied sciences. It is also noted that few state universities like GBPUAT, Uttarakhand University of Horticulture and



Technology (UUHF) in North India are following their own course content and differ in credit system, for example at UUHF the course is of two credit hours, at GBPUAT the course is optional, or elective in nature, it's one credit, and based on the advisors and students to choose from various courses that may interest them. Few Universities like Maharana Pratap University of Agriculture & Technology, (MPUA&T) Udaipur are understaffed in teaching library and therefore have not been able to incorporate IL across their regular course curriculums. The university library needs to work upon enriching their professional staff.

The Indian Agricultural Universities are governed by state and are autonomous to formulate their own course contents and may take approval from their respective academic councils for implementation. Although the Indian Council of Agricultural Research (ICAR) recommends the State universities to follow their guidelines, state universities can incorporate any changes or modifications as per their requisite.

### **Teaching Information Literacy**

Information literacy is offered by university libraries under the semester system and taught by teacher librarians. If we look at table one, 91% of the agricultural universities have teacher librarians to teach Information literacy, these include Assistant Librarians, Associate or Deputy Librarian and even Head Librarians like to teach information skills, as such there is no department for library and information sciences. At GBPUT, Haryana Agriculture University (HAU) and UUHF information literacy are taught by teacher librarians of university library under College of Basic Sciences and Humanities and the Department of Social Sciences. Universities that are understaffed engage teaching personal (PT) to teach information literacy courses, 5.88 % of the universities as indicated in the said table have engaged teachers on contact or teaching personal which is perhaps a better option than not offering IL at all, possibly universities like MPUA&T, Udaipur could do the same.

Several improvements and initiatives have been made to improve upon Information literacy programs in India, however, the Indian agricultural universities are yet to introduce subject librarians for teaching information skills. As noted from table one, none of the universities have subject librarians to teach Information literacy. Unlike the West, in the US or Europe, Indian library system does not have the concept of subject librarians to teach discipline-specific Information Literacy. Though lately, it has been a topic of discussion among professional circles.

Discipline-specific IL needs to be explored and incorporated in various subjects of agricultural sciences like Plant Pathology, Horticultural Sciences, Plant Breeding, Food Sciences, Forest sciences etc. Unlike US or European countries discipline specific IL programs or courses is quite nascent in Indian agricultural universities and has not received much attention from library and information specialist. The concept of the subject librarian is yet to find a place in Indian agricultural libraries and is not so popular. Focus on discipline-oriented IL courses is now being felt, though, no factual initiatives have been taken formally by either by Indian Council of Agricultural Research (ICAR) or State Universities. Agricultural education in India has now to evolve in tune with fast changing national and international scenario, and therefore, many

reforms are expected in quality assurance of agricultural education through the forthcoming National Agricultural Education Project (NAEP) under ICAR.

### **Skills for Undergraduates**

Most Indian Agricultural libraries are now functioning under an hybrid system and automated environment having digital resources, online catalogs, databases, digital repositories etc. therefore, IL courses are required not only for graduates and postgraduate students but also for the undergraduates. With a number of undergraduate's students enter higher education, the possibility of ensuring these students of having acquired correct skills without attending information literacy courses is essentially difficult to monitor. Tirth (1977) points out that an undergraduate finds himself bewildered when he/she first enters a university library and seems overawed to find it so different from the library of his school.

From this study, it is noted that IL courses are specifically for the graduate students. The table one reveals that none of the universities offered IL to undergraduates previously except one the Rajasthan Agricultural University. It is noted that undergraduate students are provided with an orientation of the library with guided tours and demonstration to library resources. It is further extended to providing information about learning resources via university Intranet, use of OPACs etc, this is just not enough to skill them on information competency.

King (2007), in one of his study, stated that, information environment is too complex and changing too rapidly to expect students to acquire information literacy without planned, cumulative instructional program. Therefore, embedding of information literacy skills across undergraduate's program is the current challenge for Indian agricultural universities, especially the librarians and information manager who will require to play a proactive role in getting them implemented across regular curriculums. The Indian Council of Agricultural Research (ICAR) supports policy issues, quality assurance through accreditation, common academic regulations, updated and contemporary course curricula and delivery systems. The libraries need to press upon university authorities to take up this motive at the central level and bring some uniform course syllabi for undergraduates in Information Literacy. The IV Deans committee revised UG course curricula and norms, standards and common academic regulations in 2007, however, the inclusion of IL across undergraduate course program could not emerge. (NAEP Report).

### **Blended Learning**

Unlike other subject areas in Agricultural Sciences, Information literacy, through blended methods incorporating online or e-learning courseware /tutorial packages is yet to be introduced. In fact, e-learning has not been popularized for this important subject. Most of the instructional methods are conventional i.e. face to face and lacks novelty in terms of using e-learning platforms, course management system or online tutorials, Table 2 reveals that a significant 85% universities use projectors and power point presentations for teaching Information Literacy, combining face to face and audio-visual presentations to create interest in students. Exclusive, in-class lecture from librarians is provided by 11% of the universities and they are yet to engage or expose students to other teaching methods or learning experiences.

Very few universities, in fact only one university, the G B Pant University of Agriculture and Technology has taken initiatives in e-learning by creating some digital content for postgraduate students.

Last few years have seen several changes in the higher education sector which have exerted pressure upon conventional method of teaching. Blended learning is being recognized among teaching community as it has the potential and advantage of incorporating both online and conventional instructional methodologies. The goal of blended learning is to provide more efficient and effective instruction experience by combining various delivery modalities (Gray Harriman 2004). Therefore, blended learning is the current need as well as a challenge for Indian agricultural information professionals and librarians to develop such platforms and courseware's to enhance their information literacy programs. Veronikas and Shaughnessy (2004) point out that these objects can be stored, revised and even mixed and matched to create new learning experiences for our students.

**Table 2: Innovative Teachings in Information Literacy**

Sl No.	Teaching IL / Blended learning	No. of Universities	Total percentage
1.	E-learning platform / Course mgt. system like Moodle,	01	2.95 %
2.	Other tools and devices LED/LCD projectors, power points presentations etc	29	85.29%
3.	Exclusive lecture methods	04	11.76%
	Total	34	100 %

In Indian Agricultural system, the launch of world bank aided National Agricultural Innovative Project (NAIP) in 2006 had marked a new chapter in Agricultural research. These projects broadly aimed to make agricultural research knowledge-based and IT-oriented so as meet the fast-changing consumer demands. Indian Council of Agricultural Research (ICAR) which is implementing the projects is reaching out research centers, State Agricultural Universities, Science and Technology Institutes for innovative ideas and research.

State agricultural universities under this project and were encouraged to develop e-content. Several e-courses for graduate degree programs were created under Moodle platform, for example e-courseware for bachelors in Agriculture and Veterinary Sciences by Tamil Naidu Agricultural University (TNAU) and Tamil Naidu Veterinary Sciences and Animal Husbandry (TNVASU); e-course in Horticulture by University of Horticultural Sciences, Bagalkot; e-Home sciences course by Acharya N.G. Ranga Agriculture University (ANGRAU) etc. in South India were developed for providing digital content portable anywhere, making it available online as well as offline to captivate and create interest in undergraduates studies (NAIP Report, 2011-2012). However, such courseware is yet to be developed for Information Literacy.

## **Discussion and Recommendations**

The higher education in the agricultural and allied sector has adopted technology gradually. It is noted that most of the instructions have been either through conventional or hybrid methods, the same methods of instructions followed over the years have dulled our senses. The study reveals that 85% of IL in Indian Agricultural Universities is offered through conventional face to face instruction techniques with a blend of embracing techniques like power point presentation or slides. The students need to be engaged with more innovative e-learning, course management tools and online tutorials for an improved experience in Information literacy under the hybrid class model.

Online content creation is going to be a big phenomenon in the Indian agricultural sector. Although, a beginning has already been made with blended learning in agricultural courses. Such methods of learning have mixed situation, while some subject is advanced in online courseware's other is in developing stages, for example, creation of e-courses for undergraduates in seven major disciplines of agricultural sciences is in progress in the form of projects under National Agricultural Innovative Project (NAIP) for which an online portal has also been created. E-course content in agricultural sciences for under graduates (UG) and several disciplines of Home Science studies have been created (NAIP Report 2012-2013). The librarians may trend in similar fashion. Online content or e-courses for Information literacy by Indian Agricultural libraries is in early stages and a lot needs to be explored and exploited in future.

The digital contents in various form such as e-books, e-journals, databases and now digital platforms continue to grow, these play a significant role in teaching and learning environment by facilitating sharing, content portability, and easier navigation. The Indian Agricultural libraries need to train their patrons with necessary information skills for best use of these resources and play an important role to promote technology-enhanced learning.

The information professionals need to be proactive to convince their authorities towards the need for IL courses for the undergraduates through credit system embedded in regular course curriculums. The education division of Indian Council of Agricultural Research can play a lead role in bringing such transformations and also getting it implemented being the granting body for agricultural universities in the country.

The Massive Online Open Access Content popularly known as MOOC have made a mark in the field of education in the recent years and needs to be explored by information professionals for information literacy as well to create learning environment characterized by variety, diversity, and novelty in MOOC Information literacy courseware. Blending face to face teaching method with technology-enhanced learning is the need of the present time which is also promoted by the digital India initiative of the government.

Indian library system also needs to explore and introduce subject librarians for teaching information literacy like universities in western countries. Currently, Indian Agricultural universities do not have the concept of subject librarians to teach discipline-specific Information Literacy. Though it has been a topic of discussion among professional circles, concrete steps and motivated efforts are required to blend the existing information literacy with subject information literacy. Agricultural universities offer a variety of programs in different disciplines or branches

of agricultural sciences, exclusive discipline oriented IL shall be an interesting experience for information professionals and there is a lot of potentials for the librarians to be innovative in their services.

## **Conclusion**

The finding from this study is promising, it is interesting to note that Indian Agricultural universities, now have, largely a uniform course content on Information literacy for postgraduate studies across the country with few exceptions. It is discouraging to note that, there are no formal embedded courses for undergraduates to learn information skills, bare orientation may not serve the purpose. It is likely that most students acquire the skills necessary to exploit electronic resources either through trial and error or from other students on their own, raising the questions on the effectiveness of these skills. Therefore, the challenge lies on teacher librarians to introduce information literacy in undergraduate programs through structured courses embedded in regular curriculums, they also need to work closely with their academic council to impress upon the importance of these courses in supporting the core degree programs.

In this era of globalization, the higher education has seen several changes, the ICT tools and techniques have facilitated and enhanced learning through innovative, more flexible, and interactive approach for delivering content through online systems and platforms also known as e-learning or technology-enhanced learning. These innovative learning needs to be incorporated in Information literacy programs offered by the agricultural libraries.

Sundararajan and Gopal (2014) point out that despite weaknesses, online education is going to be the next big phenomenon in India. A fresh and innovative perspective in the mode of delivering educational content engaging online e-learning experiences is vital. The Information professionals of agricultural universities have tremendous opportunities to come out of their traditional roles to exploit and innovate their services for outreach at a larger audience or student community at remote locations who are learning through online platforms or distance mode of learning.

Further research is required to show how best Information Literacy courses can be provided through a blended approach, online channels or open courses like MOOCs and outreach using state of the art technologies in the educational sector. The information professionals will need to stay alert and open to changes in how and what they teach and keep pace with technology-enhanced learning and also use innovative ways for engaging students to enhance their information skills.

## References

- Agyekum, B.O, Sarpong K..N. and Arthur B. 2017. A survey of Information Literacy (IL) programs in Technical University libraries in Ghana, Library philosophy and practice. <https://digitalcommons.unl.edu/libphilprac/1644>
- American Library Association.1989. Evaluating information : Information literacy. Final Report, Jan 10 1989. <https://libguides.ala.org/InformationEvaluation/Infolit>
- Association of College and Research Libraries. 2000. Information Literacy Competency Standards for Higher Education. American Library Association. Retrieved from <http://www.ala.org/ala/acrl/acrlstandards/informationliteracycompetency.htm>
- Bavakutty M and Nasirudheen T.P.O. 2008. Assessing Information literacy competency of Research students in India: A case study Abrizah Abdullah, et al. (Eds.): ICOLIS 2008, Kuala Lumpur: LISU, FCSIT, 2008:109-121.
- Brasely and Sterling. 2008. Effective librarian and discipline faculty collaboration models for integrating IL into the fabric of an academic institution, New Directions for Teaching and Learning. 114: 71-88
- Chrzastowski, T E and Joseph, L. 2008. Surveying graduate and professional students perspectives on library services facilities and collections at the University of Illinois at Urbana-Champaign: Does subject discipline continue to influence library user? Issues In Science and Technology Librarianship 45. Retrieved from <http://www.istl.org/06-winter/refereed3html>
- Common Academic Regulations, ICAR.2015. <http://www.icar.org.in/files/edu/Revised-PG-Course-Curricula-and-Syllabi/Common%20Academic%20Regulations.pdf>.
- Coupe, Jill. 1993. Understanding library skills: Two surveys at John Hopkins University. Research Strategies 11, (fall): 188
- Education Division, ICAR . 2009. New restructured postgraduate curricula and syllabi. <https://icar.org.in/files/edu/Revised-PG-Course-Curricula-and-syllabi/Social%20Sciences%2030.4.2009.pdf>
- Fyffe, R., and Walter, S. 2005. Building a new future: preparing future faculty and responsible conduct of research program as a venue for scholarly communication discussions, College and Research Libraries, 66, (9), 654-663.
- Green, R., and Mary B. 2006. Observation from the field: Sharing a literature review rubric, Journal of Library Administration, 45 (1/2), 185-202.
- Green R. 2006. Fostering a community of doctoral learner, Journal of Library Administration. 44, (1/2) 169-183.

Harriman, Gray. 2004. What is Blended Learning? E-Learning Recourses. Retrieved from [www.grayharriman.com/blended\\_learning.htm](http://www.grayharriman.com/blended_learning.htm)

Harrington, Marni R .2009. Information Literacy and Research intensive Graduate students: Enhancing the role of research librarians, Behavioural & Social Sciences librarian. 28,( 4) 179-201.

Hidmani M.B and Rajgoli IU. 2010. Assessing Information literacy competence among the undergraduates' students of the college of Agriculture, Raichur: A case study, DESIDOC journal of library and Information Technology 30(2) 70-78

ICAR. 2009. National Core Group (NCG) <http://www.icar.org.in/files/edu/Revised-PG-Course-Curricula-and-Syllabi/Common%20Academic%20Regulations.pdf>

ICAR. 2010. Indian Council of Agricultural Research (ICAR). Retrieved from <http://www.icar.org.in/en/aboutus.htm>

King, Lizette. 2007. Information literacy of Incoming undergraduate art students at the University of the western cape: assessment of competencies and proficiencies <http://etd.uwc.ac.za/xmlui/handle/11394/2194>

LL Rai University of Veterinary and Animal Science, (LUVAS).2016. PG syllabus, non-credit compulsory Courses, Retrieved from [www http://luvas.edu.in/download/syllabus/compulsory-non-credit-courses.pdf](http://luvas.edu.in/download/syllabus/compulsory-non-credit-courses.pdf)

National Agricultural Education Project (NAEP).2012. Retrieved from <http://www.icar.org.in/files/NAEP-Project-documentt.pdf>

National Agricultural Innovative Project (NAIP) progress report 2012-2013 accessed from [http://naip.icar.org.in/documents/10184/41065/NAIP\\_APR\\_2012-13.pdf/777ca1d3-fd9f-4cd9-b7bf-6596b099b35b\\_2012-2013](http://naip.icar.org.in/documents/10184/41065/NAIP_APR_2012-13.pdf/777ca1d3-fd9f-4cd9-b7bf-6596b099b35b_2012-2013)

National Agricultural Innovative Project (NAIP).2010. ICAR, Annual Progress Report 2009-2010

Parrish .1989.Academic community analysis: discovering the research needs of graduate students at Bowling Green State University, College and Research Library News 50(8), 644-646.

Patridge, Helenetal.2008. The Reflective Online Searching Skills (ROSS) Environment: Embedding information literacy into student learning through an online environment. IFLA Journal 34(1): 55-71.

Piette, M., and Dance, B.1993. A statistical evaluation of a library orientation program for graduate students, Research Strategies. 11: 164-73.

Price, R., and Becker et al. 2011. Embedding information literacy in first year business undergraduate Course. *Studies in Higher Education*. 36(6), 705-718

Proulx M., and Mallet H. 2006. La creation, l'implantation et l'evolution d'un cours credite obligatoire de formation documentaire aux cycles superieurs a l'Elcole Polytechnique; la realite d'un suces. 35( 2), 17-23

Rader, H. B. 2002. Information literacy 1973-2002: A selected literature review. *Library Trends*, 51(2) 242-259

Randhawa M. S. 1968. Agricultural Universities in India: Progress and problems. Retrieved from [pdf.usaid.gov/pdf\\_docs/PNABJ266.pdf](http://pdf.usaid.gov/pdf_docs/PNABJ266.pdf)

Rempel, H.G and Davidson, J. 2008. Providing information literacy instruction to graduate students through Literature Workshops. *Issues in Science and Technology Librarianship*. Retrieved from [http://www.istl.org/08/winter/refereed\\_2.html](http://www.istl.org/08/winter/refereed_2.html)

Rodriguez, Ariel. 2005. Training students to be better consumers of research: Evaluating empirical research reports. *College Teaching*. 53: 99-101.

Roth, Lorie. 1999. Educating the cut and paste generation. *Library Journal*. 124, 42-44.

Schmidt, D. 1993. The electronic library: A bibliographic instruction course for graduate students in the life sciences *Science and Technology Libraries* 14, 49-60.

Sharma, Y. 2010. Information Literacy in Indian Agricultural Universities: A study of Punjab Agriculture University, *Library Herald* 48(4) 345-357

Singh, Neena. 2014. Educating for Information Literacy: Assessing Indian Agricultural Sciences graduate's knowledge and information skills *Library Philosophy and Practice*. Retrieved from <http://digitalcommons.unl.edu/libphilprac/1102/>

Sundararajan and Gopal V.B.N. 2014. Online Education: Riding the Next Wave in Education. *University News* 52(14) 6-7.

Tirth .1977. Readers Instruction in Agricultural universities: some dimensions In ICAR-PAU seminar on Agricultural Librarianship and Documentation, Ludhiana 2-5 Feb 1977, papers and proceedings, Punjab Agricultural University.

Uniyal N and Kaur B. 2018. Proposition of media and information literacy curriculum for integration into pedagogy in IITs, *DESIDOC Journal of Library & Information Technology*. 38(3) 221-226

Veronikas, S.W, and Shaughnessy M. F. 2004. Teaching and learning in the hybrid world. *Educause Review*, July-August, 51-62



Wilder, Stanly J. 2013. Reconsideration of Information literacy, Communications in Information Literacy 7 (2) 146-147

Zurkowski, P.G. 1974. Foundations of Information Literacy. Retrieved from <http://infolit.org/paul-g-zurkowski/>

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## Appendix-I

Table 1: View of Indian Agricultural Universities offering Information Literacy Courses embedded into course programs

Sl.	Name of the Universities in different States of India	New Course as per ICAR Guidelines PGS-501 Compulsory	Previous Course Titles	UG/PG /Ph.D.	Year of Start	Mandatory /Optional Previously	Teachers Librarians (TL)  Subject Librarian (SBL)
1	The Acharya Narendra Dev University of Agriculture. & Technology, Faizabad.	Yes	Use of Scientific and Technical Literature I (1+0)	PG /Ph.D	-	C	TL
2	Assam Agriculture & Tech University, Jorhat, Assam	Yes	Technical Writing & Library Use (TWL) Noncredit	PG	1983	C	TL
3	Anand Agriculture University, Gujarat	Yes	-	PG/PhD	-	C	TL
4	Babasaheb Sawant Konkon Krishi University. Goa	Yes	-	-	-	-	TL
5	Bihar Agriculture University, Bihar	Yes	-	-	-	-	TL
6	Birsa Agriculture University, Bihar	Yes	No course	PG		C	TL
7	CCS Haryana Agriculture. University, Hisar (HAU) Haryana	Yes	Library Science and Technical writing 1(1+0)	PG / Ph.D	1982	C	TL
8	CSA University of Agriculture & Technology Kanpur, UP	Yes	No course	-	-	-	TL
9	Dr. Balasaheb Sawant Konkon University	Yes	-	PG	-	-	TL
10	Dr. Panjab Rao Deshmukh Krishi Vidyapeeth, Akola	Yes	Scientific Report Writing and use of Library AG, Extn-6131 (1+0)	PG	1978	C	TL
11	Dr. Y S Parmar Univ. of Horticulture & Forestry, Solan	Yes	Literature and Technical writing –501 1 (1+0)	PG /Ph.D	1985-86	C	TL

12	G B Pant University of Agriculture. & Technology, Pantnagar	NO	Storage & Retrieval of Scientific Information-610 1 (1+0)	PG	1976	O	TL
13	Himachal Pradesh Krishi Vishwavi. Palampur	Yes	Literature and Technical Writing – 5011 (1+0)	PG	1982	C	TL
14	Indian Agriculture Research Institute (IARI) New Delhi	Yes	Agriculture Information System (AIS)1 (1+0)	PG	1982	C	TL
15	Indira Gandhi Krishi Vishwavidhyalaya Raipur, MP	Yes	Biological Literature and Reference work 1 (1+0)	PG	1970	C	TL
16	Jawaharlal Nehru Krishi Vishwavidhyalaya., Jabalpur, MP	Yes	Agriculture Information System (AIS)1(1+0)	PG	-	C	TL
17	Junagarh Agriculture University, Gujrat	Yes	-	-	-	-	TL
18	Mahrana Pratap University of Agril. & Technology, Udaipur, Rajasthan	No	No Course-	-	-	-	-
19	Navsari Agricultural University, Gujarat	Yes	-	-	-	-	TL
20	Rajasthan Agriculture University, Bikaner, Rajasthan	Yes-	Library and Information Usage 1(1+0)	UG	-	C	TL
21	Rajendra Agriculture University, Samastipur, Bihar	Yes	-No course	-	-	-	TL
22	SardarkrushinagarDanti wadaAgril.Univ. Banaaskantha Gujarat	Yes	Scientific and Technical Writing STW 3(3+0)	PG	-	C	TL
23	Shere Kashmir University of Agriculture Sciences & Technology, Shirinagar	Yes	Library Science & Technical Writing LIB 601, 1(1+0)	PG	1982	C	TL
24	Sher-e Kashmir University of Agriculture & Technology Jammu	Yes	Library Science & Technical Education1(0 +1)	PG	1999	C	TL
25	Sardar Patel Agriculture University, Meerut UP	Yes	-No course-	-	-	C	TP

26	Tamilnadu Agriculture University Coimbatore	Yes	Research Methodology & Library ABT -610 1(1+0)	PG	-	C	TL
27	University of Agricultural Sciences, Dharward.	Yes	Introduction to Library Sc. (Lib-14)1 (1+0)	PG	-	C	TL
28	University of Agriculture Sciences, Bangalore	Yes	Utilization of Library facilities(Non Credit)ORN	PG/PhD	-	C	TL
29	Kerala Agriculture University, Trissur	Yes	Use of Library part of Research planning & Implementation on RM (610) 3(2+1)	PG /PhD	1996	C	TL
30	Manipur Agricultural University Manipur	Yes	-No course	-	-	-	TL
31	Marathwada Agriculture University Parbhani	Yes	Scientific Report Writing 2(1+1)	PG	1977	-	TL
32	Orissa University of Agril& Technology, Bhubneswar	Yes	-No course	-	-	-	TL
33	Punjab Agriculture University, Ludhina	Yes	Technical Writing & User Education (TW 501)	PG	-	C	TL
34	Uttarakhand University of Horticulture & Forestry , Uttarakhand	NO	Scientific Information & Retrieval Techniques	PG	-	O	TP *
Total : 34		Yes :31 (91.17%)	Yes : 21 ( 61.76% )			C : 21 ( 61.76%)	TL: 31 (91.18%)
		No :03 (8.82%)	No : 7 ( 20.58% ) NA : 6 ( 17.64% )			O : 02 (5.88%)	TP : 02 (5.88%)
						NA :11 ( 32.35%)	SL: Nil

### Abbreviations Used

\* PGS-501: Library and information services is non credit compulsory course

ICAR : Indian Council of Agriculture Research

C : Compulsory course

O : Optional course

- ORT : Orientation only  
 IVRI : Indian veterinary Research Institute  
 NDRI : National Dairy Research Institute  
 CIFE : Central Institute of Fisheries education  
 CeRA : Consortium of e- resources in Agriculture

## Appendix II



## Appendix-III

Questionnaire in brief used for data collection

1. Please identify the name of the university you attribute yourself.

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2. Does your library offer information literacy courses to students.

1. Yes
2. No

3. If yes, is it offered to :

- a) Post Graduate Students
- b) PhD Students
- c) Under Graduate students

4. If No, do you offer orientation courses

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5. Mention the title of the course and course number if any.

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6. Please provide the content /course description of Information Literacy.

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7. When was Information Literacy started in your university library

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8. Is the course integrated into regular course curriculums.

1. Yes

2. No

9. Is the course compulsory or optional

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10. Was the course changed after the new ICAR guidelines in 2009-2010 to PGS-501.

Yes \_\_\_\_\_

No \_\_\_\_\_

11. Do you use tools like E-learning platform & Course management system for teaching IL please mention the tool.

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12. Do you use other innovative method, tools and devices for teaching IL.

Yes \_\_\_\_\_ name the tool \_\_\_\_\_ No \_\_\_\_\_