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Digital Information Literacy among the Engineering Students: A Survey

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Abstract:

This paper describes the level of digital information literacy among engineering students of Kurukshetra University, Kurukshetra affiliated Institutes (Ganpati Institute of Technology & Management, Shivalik Institute of Engineering & Technology and Swami Devi Dyal Institute of Engineering and Technology). In this study, an attempt has been made to know the information literacy competency among the students. A questionnaire was prepared for data collection and distributed among students of each Institute. The response rate was 90% (42 from GITM, 47 from SIET and 46 from SDDIET). The result of the study shows that email is the most indispensable source of information for all students. The usage of search engine has high percentages (68.8%) among students. Further, the result indicated that to collect study material with usage of digital resources is top priority of students. It is found that objectivity (67.4%) is the most important criteria for evaluation of web resources by the students. Additional result show significance differences in the e-information need, using digital resources, ICT skill and Internet search tools among all students.

Keywords: Information Literacy, Digital Information Literacy, Institute library, engineering students

Introduction:

Technology is the portal through which we interact with information. The development of technologies and their integration in all spheres of people's life gave for the first time a possibility for a fast and unlimited access to vast information which is constantly enriched, transformed and actualized. The Internet and new media communication technologies with their interactive and increasingly individualized digital services changed people's habits and behaviour, building new value models and vital cues. They are becoming an irreplaceable source of education and important tool for the development of new literacy. No previous technology for literacy has been adopted by so many, in so many different places, in such a short period of time, with such profound consequences.

We live in an online world with the digital divide closing up through government initiative. Universities and colleges have a responsibility to develop students who can thrive in an era of digital information and communication. Those who are digitally literate are more likely to be economically secure and these skills are especially important in higher education given that graduate white collar jobs are almost entirely performed on computers and portable devices. Digital literacy is about being empowered and confident to live, learn and work in a digital society. Digital information is becoming essential to almost every aspect of modern life which means that there is a need as never before. Digital information literacy requires a degree of skill like using computers and the Internet for many aspects of study at this level, for example, enrolment, accessing online course materials, preparing assignments, checking grades and communicating with teachers.

The process of identifying and selecting the specific information has become an extremely complex task. Many users fail to properly locate evaluate and use internet based information due to lack of understanding of technology and the structure of internet based information. And due to complexities of information in electronic form, the users are unable to access and retrieve it. Hence in this crucial condition, it is the need of the era to empower the

users to provide right and effective direction to access digital information which can be effectively practised by the promotion of information literacy in digital era.

Literature Review:

Meenu and Kumar (2020) stated that ICT has changed the way of people to assume, behave and talk. It involves storage, retrieval, manipulation, transmission or receiving of any records electronically in a digital shape. Ayyanar and Thirunavukkarasu (2019) reported that all students have aware with ICT and Internet. It is found that majority of students using Google Chrome browser, IEEE e-database, Ms Office, Laptop and Tablets, can connect laptop with projector and access needed information. Whereas mostly students are not aware of security risks to share personal information on NET. Kumar and Gaur (2019) stated that the increasing vogue for the use of e-books as a good standing and more strongly their prominent role in our cognitive development is really commendable. Noh (2017) explored that bit literacy influences information use behavior most, followed by virtual community literacy and technical literacy. Brar (2015) found that 84% of respondents were aware about internet technology and were needed for electronic information resources to update their knowledge. The authenticity and reliability were used by the respondents for evaluation of electronic information sources. Kumar (2014) found that Internet literacy is increasing among students by usage of the Internet on their own cell phones frequently. However, the study reveals that Internet usage for education and research purpose is below the average values. Shopova (2014) explores that majority of respondents positively evaluated their ability to work with computers to access information on Web daily with preference to Google search engine. The study revealed that half of respondents were able to analyze and synthesize information; compares information obtained from different sources, and were willing to participate in specific training courses to increase their digital competence. Kumar (2013) found that students use the Internet to access electronic journals (62.5%), software download (31.5%), and entertainment (58.75%), News Paper (33.75%), Research purpose (70%), for education (81.25%), and e-mail. Google and Yahoo search engines are preferred by almost students. Kumar (2013) suggested that libraries should organise the orientation programmes as well as library sites should create a management tool for exploiting digital products and services. Konappa (2013) found that majority of respondents demand e-resources for electronic information to keep their research knowledge up-to-date, whereas they have less knowledge of MS-Office, DTP tools, and programming language applications except Internet. N. and Pattar (2013) described that respondents have their computer with internet, smart phone, digital camera and I-pad which were highly used tools for study, research and personal. E-mail and face book are the most widely used web based services. Jeffrey et al. (2011) indicated that obstacles such as low self-efficacy, low confidence, and negative attitudes to technology were substantially reduced by meet number of conditions to the participants where they felt a part of the supportive community. Hadimani and Rajgoli (2010) found that 94.44 % of the students had the ability to recognize a need for information and had the ability to locate the needed information with assistance either by library staff or faculty members. Issa et al. (2009) found that most students were aware of the e-library resources which were not used due to lack of skill. The university does not have a specific information literacy standard for its students.

Objectives:

- To know which type of e-information needed among the students
- To know Purpose of using Digital Resources
- To know the ICT Skill level of the students
- To know preference of using the Internet Search tools

- To know the evaluation rating of the web resources

Methodology:

With the above technological background the present survey was limited to three engineering institutions affiliated to Kurukshetra University, Kurukshetra namely (i) Ganpati Institute of Technology & Management (GITM), Yamuna Nagar, (ii) Shivalik Institute of Engineering & Technology (SIET), Ambala and (iii) Swami Devi Dyal Institute of Engineering and Technology (SDDIET), Panchkula. Hereafter, abbreviated forms of these institutions are used throughout the paper. In this study, an attempt has been made to know the level of digital information literacy among the engineering students. Questionnaire method as a tool for data collection was used to fulfill the objective of the survey. 50 questionnaires were distributed in each institutes among students who were present in the library and received back 42 (84%) from GITM, 47 (94%) from SIET and 46 (92%) from SDDIET. The response rate was 90%. The chi-square test was used at 0.05 % level of significance to know the variation of digital information literacy among the engineering students.

Hypotheses:

The following null hypotheses were formulated and tested by employing chi-square statistical tool.

H1– There is no significant difference between the student’s e-information need.

H2– There is no significant difference in purpose of using digital resources by students.

H3– There is no significance difference between ICT skills of students.

H4– There is no significance difference in use of Internet search tools by student.

H5– There is no significance difference in evaluation of web resources by the Students

Data Analysis:

Table 1: Types of e-information needed

E-information Sources	Respondents			Total	$\chi^2(\text{df; c})$	<i>p</i>
	GITM	SIET	SDDIET			
e-journals	12	23	29	64	27.94* (12, 21.03)	P=0.01
e-articles	16	41	37	94		
e-databases	0	3	7	11		
e-mail	42	47	46	135		
e-books	3	13	21	37		
e-news groups	9	22	27	58		
e-subject gateway	0	8	13	21		

In response to the question how much type of e-information is needed, Table 1 indicates that e-mail is most needed e-information source of all students of GITM, SIET and SDDIET. 69.6% (11.8% from GITM, 30.4% from SIET and 27.4% from SDDIET) of the students need the e-articles for e-information, followed by 47.4% (8.9% of GITM, 17% of SIET and 21.5% of SDDIET) e-journals, 42.9% e-news groups and 27.4% e-books. Whereas, e-subject gateway (15.5%) and e-databases (8.1%) are less needed as e-information sources by the students. The calculated value of χ^2 (27.94) is greater than the critical value (18.31), i.e., $27.94 > 21.03$. This

shows that there is significant difference among the engineering students needs of e- information source. It is identified with the statistical analysis of Chi-square the structured hypothesis H_1 is rejected at 0.05 level of significant.

Table 2: Purpose of using Digital Resources

Purpose	Respondents			Total	$\chi^2(\text{df; c})$	p
	GITM	SIET	SDDIET			
Class Work	22	29	35	86	40.51* (10, 18.31)	P = 0.00
For study	34	47	46	127		
To update subject Knowledge	42	44	46	132		
To collect study Materials	42	47	46	135		
To carry out project work	0	43	46	89		
To connect with professionals group	20	47	46	113		

Every student has a purpose to use digital resources with different approach. An attempt was made to know which purpose is on the highest rank among engineering students. Table 2 shows the college wise students purpose of using digital resources. The SDDIET students have the top position with respect to their overall purpose of using digital resources except class work (26%). The SIET students give the first preference to digital resources for study (34.8%), to collect study materials (34.8%), to connect with professionals group (34.8%). Whereas, digital resources are used to update subject Knowledge, to carry out project work and class work by 32.6%, 31.8% and 21.5% of SIET students respectively. The GITM students give top response using digital resources to update subject Knowledge (31.1%), to collect study Materials (31.1%), for study (25.2%) whereas less responses given to class work (16.3%) and to connect with professionals group (14.8%). It is noted from the result that the purpose to collect the study material among students has the highest rank with usage digital resources. The chi square is significant at 0.05 level of significance. It is indicated that there is significant variation among student usages to digital resources and based on the statistical result the structure null hypothesis H_2 is rejected.

Table 3: ICT Skill of the students

ICT Skill	Respondents			Total	$\chi^2(\text{df; c})$	p
	GITM	SIET	SDDIET			
Laptop	24	37	32	93	22.98* (8, 15.51)	P= 0.0034
Destop	18	10	14	42		
Smart Phone	38	31	36	105		
I-Pad	0	6	12	18		
Internet	23	47	46	116		

To know the ICT skill, students were asked to indicate their skill of ICT literacy. It is evident from Table 3 that 34.1% of SDDIET students have knowledge of Internet application, followed by 26.6% of Smart Phone and 23.7% of Laptop. The SIET students have the high knowledge to use internet (34.8%), Laptop (27.4%) and Smart Phone (23%). Whereas GITM students have high knowledge of Smartphone (28.1%), followed by Laptop (17.7%) and Internet (17%). It is noticed from the table that the application knowledge of Destop and I-Pad are low among all

students. Chi-square test results do not support the null hypothesis and there is significance difference between the ICT skill of students and structured null hypothesis $H3$ is rejected.

Table 4: Use of Internet Search tools

Internet search tools	Students			Total	$\chi^2(\text{df; c})$	<i>P</i>
	GITM	SIET	SDDIET			
Search Engine	22	38	33	93	19.68* (10, 18.31)	P= 0.03
Subject Gateway	0	5	12	17		
Online Database	4	7	6	17		
Digital Library	3	3	5	11		
Meta Search Engine	0	1	9	10		
Web Portal	13	27	39	79		

There are different types of internet search tools. Table 4 shows that high percentages (68.8%) of the search engine are used by all students. Web Portal search tool is the second preference by students of GITM (9.6%) and SIET (20%) whereas SDDIET students have first preference to use Web Portal. It is found from the table that other internet search tools like Subject Gateway, Online Database, Digital Library and Meta Search Engine are less preferred by the all students. The value of chi-square is 19.68 and degree of freedom is 10. The value of p (0.03) reveals the statistically significance ($p < 0.05$). The variation among students has been found as far as Internet search tools are concerned.

Table 5: Evaluation of web resources by the Students

Evaluation	Students			Total	$\chi^2(\text{df; c})$	<i>p</i>
	GITM	SIET	SDDIET			
Reliability	19	21	24	64	7.76* (16, 26.30)	P= 0.96
Authenticity	21	15	18	54		
Accessibility	25	26	30	81		
Objectivity	28	32	31	91		
Usability	17	23	27	67		
Comprehensive	9	17	19	45		
Money	10	17	15	42		
Exposure	9	16	18	43		

In order to know the evaluation rating of the web resources by the students, a question has been put to the students. The replies given by them are shown in Table 5. The analysis of the data shows that objectivity (67.4%) is the most important criteria for evaluation of web resources followed by accessibility (60%), usability (49.6%) and reliability (47.4%). The chi-square test is significant at 0.05 level of significance. There is no significant variation in evaluation of web resources by the students. It has been found that the calculated value is less than the critical value at 0.05 level of significant and the structure null hypothesis $H5$ is accepted.

Conclusion:

The new academic community model needs students who have the necessary knowledge and ability to take advantage of the potential of the new technology and actively participate in

economic, social and cultural life. The present study is conducted with the objective to know the digital information literacy between the engineering institute students. The study found significant difference among students in relation to the e-information need, using digital resources, ICT skill and Internet search tools except the evaluation of web resources. However, result shows that most engineering students depend on e-mail for e-information as well as use search engine as digital resource for collecting study materials.

The survey found that less number of students does not prefer e-subject gateway, e-databases as e-information sources whereas they have low response to use digital resources for class work and carry out project work. It is noted that all the students have low level ICT skill regarding IPAD, Lap top and desktop. The survey result also reveals that other internet search tools like Subject Gateway, Online Database, Digital Library and Meta Search Engine are less preferred by the all students. To develop a fully e-educational environment and increase the awareness of digital resources among students, it is needed to develop digital information literacy. Every engineering institute has various types of digital information resources for students and Library can play an important role to develop digital information literacy among students.

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