Information and Computer Literacy Skills of Computer Science Students in Enugu State, Nigeria

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Abstract
The paper, which is an empirical one, takes a look at the information and computer literacy skills of Computer Science Students in Enugu State, Nigeria. The students were asked how proficient they are in fifteen core computer literacy skills and fifteen core information literacy skills. Major finding indicated that the Computer Science students are far more computer literate than information literate. Computer literacy is, after all, a tool that facilitates information literacy skills acquisition. To strike a balance between computer and information literacy skills acquisition, suggestions were made. They include: information literacy skills should be integrated into the curriculum; teachers should always emphasize problem-based learning in their teaching; instructors must collaborate with librarians in order to inculcate adequate information literacy in students; and there should be less emphasis on packaging information for students.

Keywords: information, computer literacy skills, computer science, students

t**1.1 Introduction**

To many scholars, information literacy and computer skills are like Siamese twins. To some other scholars, the two concepts, though related, are strikingly different. The later argue that information literacy is a big umbrella housing computer literacy. Put simpler, information literacy is the mother of computer literacy. It is not, therefore, surprising that many students are computer literate but lack information literacy. There are cases where students, in order to complete a class assignment, download materials and submit same as a completed assignment without sieving the downloaded materials. One of the contributors to this study is a living witness. He gave an assignment to students and some of them (students) went to the net, downloaded articles, bound them, and submitted same as having completed their assignment. Such students not only ignored page limitation instruction but included irrelevant materials in their assignment. This is a clear evidence of lack of information literacy which is the ability to recognise when information is needed, the extent of needed information, identify, locate, evaluate, and use information effectively to solve problems. The import of the study, therefore, is to empirically prove that there is a world of difference between information and computer

literacy skills.

What is then information literacy? The American Library Association (ALA) (1998) defined it as the ability to recognise when information is needed, identify, locate, evaluate, and use effectively information needed for a particular decision or issue at hand. The information literate people, according to Erich and Popescu (2017), should be able to determine what information is needed, find the necessary information, evaluate the quality of the various sources of information, effectively use the information for a specific purpose; and manage the information in a socially acceptable way. On the other hand, computer technology according to Williams and Sawyer (2005) is any technology that helps produce, manipulate, store, communicate, and/or disseminate information using communications technology.

From the definition of the two concepts, it appears that computer literacy is an aspect of information literacy (IL) and only most useful as a tool to advance the knowledge of IL. Granted that the concepts are closely related, the extent of their relationship is what the study seeks to explore empirically.

1.2 Objectives of the Study

The main objective of the study is to explore the relationship between information and computer literacy skills of computer science students. The specific objectives of the study include:

1. To ascertain the level of IL skills of computer science students.
2. To determine the level of computer literacy skills of computer science students.
3. To compare IL skills and computer literacy skills possessed by students.

2.1 Review of Related Literature

Ab initio, the need for information informed the great interest in information literacy and information and communications technology. From antiquity, information was highly regarded and valued and those who acquired it were highly respected men in the society. It is for this reason that Todd (2003) opined that information is essential to the functioning of the individuals, social groups, organisations, and societies, and to the ongoing improvement of the quality of life. Njoku (2006) also stated that information is the key to today's world and anyone who wants to win cannot afford to ignore it. Not only that people should be informed, they are expected to be reasonably information literate. The characteristics of the information-literate person have been highlighted in the introductory part of this work. The main focus in this section is to explore the need for information literacy.

A lot of scholars argue in favour of the need for information literacy for different reasons. For instance, American Library Association (ALA) (1998) offered four reasons: in business, in citizenship, in democracy, and the empowerment of citizens. A manufacturing firm, for instance, must be involved in a serious research before introducing a new product into the market, otherwise it could be accused of producing an already patented item. Also, some businesses involve in dubious advert to sell their wares, but an information-literate person would always escape being deceived.

In citizenship, ALA (1998) reasoned that if a group of women are faced with the problem of child abuse in a particular society, they may wish to know what brings about it, what evidence of child abuse in the society, and the likely actions they can take. With the knowledge of information literacy, however, they can solve this problem without any cost to their organisation. On democracy, it is argued that information literacy is central to be the practice of democracy because information-literate people are able to spot

injustices, chicanery, and corruption of the government in power. Still on citizenship, Correia (2017) argued that for individuals to participate in public life, each person needs acquire specific skills. According to her, these skills range from literacy to communication and information literacy skills. These skills enable one to locate, access, retrieve, evaluate, interpret and act on information to be able to participate in community affairs. The idea that citizens in the information-rich countries participate more in public life than the citizens in the information-poor countries is not debatable.

Toffler (1990) anchored his own reason on the phrase "information" overload to explain the feeling of being overwhelmed, frustrated and even being intimidated by the amount of information available today. On the use of information literacy to the economy, Ogbo (2012) argued that the major economies of the world are already regarded as information or post-industrial economies in which information is a major commodity requiring information technology as critical component for economic, social, and political development. According to him, survival in such an environment depends on information literacy and the information skills which it implies. Bloom, Barrows, Lafleur and Squires (2017) did a study on "The Economic Benefits of Improving Literacy Skills in the Workplace" in Canada. They discovered that there are clear economic benefits for both the employers and the employees in improving workplace literacy. Findings indicated sixteen benefits to the employers – increased ability to handle training on the job, better team performance, improved labour management relations, increased quality, etc. the study also revealed that the employees, on their part, gain significant benefits when they improve their information literacy. These benefits include: ability earn more income, less likely to be unemployed, high job mobility, etc.

Also contributing to the need for information literacy, Bruce (2002) opined that information literacy is generally seen as central to the pursuit of life-long learning and improvement in academic achievement. Also contributing to the use of information literacy in academic achievement, Solemani (2014) asserted that no student can ever pursue the ends of his studies unless he makes use of his information literacy skills. His study revealed that there is a significant relationship between information literacy and students' academic performance. Finally, Stern (2002) observed that teaching information literacy skills is an effective strategy for freeing people from tyranny, providing opportunities, and moving people out of poverty.

There are also strong arguments among scholars in favour of the use of computer technology in library operations. Uzoigwe (2008) argued that it is not only in the library that computer technology has made impact. According to her, computer technology rules the world today and all aspects of human endeavour enjoy its services of which the library is not left out. She offered eight areas the computer can conveniently be utilized by the library: House-keeping applications (e.g. serial control, circulation, cataloguing, ordering, and collection of statistics); information retrieval (making it more convenient, flexible, comprehensive, and faster); fast processing capacity; data capture; easier and faster resource sharing among libraries; more dependable; office assistance (thereby allowing the librarians to concentrate on research and policy formulation); permanent and efficient storage facilities; service oriented (e.g. online search services, selective dissemination of information); and electronic publishing (such as electronic journals).

Contribution his own quota to the merits of computer application to library services, Nwachukwu (2007) posited that the following advantages are derivable:

➢ Allows easy integration of various

services;
- ➢ Facilitates co-operation and formation of library networks;
- ➢ Helps to avoid duplication of efforts within a library and between libraries in a network;
- ➢ Eliminates some uninteresting and repetitive work;
- ➢ Helps to increase the range of services offered;
- ➢ Provides marketing opportunities of its services;
- ➢ Ultimately, may save and/or generate money; and increases efficiency.

Regarding the relationship between information literacy and computer literacy, many scholars are of the opinion that the concepts are strikingly different. Usman (2005), for instance, contended that information literate persons necessarily develop technology skills. Information skills, according to him, enable an individual to use computers, software applications, databases and other technologies to achieve a wide range of academic, work-related, and personal goals. Information literacy is therefore, a big umbrella housing other "literacies". Reinforcing the argument above, Todd (2003) stated that although young people enjoy searching for information on the web are motivated to use it as a communication and entertainment tool, they show interaction patterns that suggest a number of barriers to effective information seeking and use. In a related development, Kurruppu and Gruber (2006) asserted that the information seeking ability of undergraduates which they studied was low contrary to what they (undergraduates) thought of themselves.

Placing computer literacy under IL, Saad and Zainab (2002) also argued that information literacy uses IT but is ultimately independent of IT. According to them, computer literacy is just an aspect of IL.

Similarly, Stern (2002) observed that information literacy is not dependent on digital tools such as computers as information literacy existed and still exists in cultures that have an oral tradition of learning. In conclusion, she argued that having access to the computer does not make someone information literate any more than owing a pen makes one a writer; as computers and pens are merely literate tools.

Competencies in computer and information literacy, no doubt, are a great boost to efficient service delivery in libraries. The acquisition of computer literacy and IL by the librarians would position them well for rendering high profile reference services. On the part of users, adequate knowledge of computer and IL would lessen the work stress of librarians as users would now be in a position to help themselves find the information they needed. Not only would users find their needed information, they would also bring to bear their knowledge of information of literacy in the way they package information.

3.1 Research Method

Questionnaire was used as data gathering instrument. The questionnaire items comprised of thirty items, 15 from IL outcomes and 15 from core competencies in computer. The 15 IL core outcomes were selected from the 187 IL outcomes as articulated by ACRL (2000) while the core 15 computer skills were supplied by a computer expert. Questionnaires were administered to final year students of computer science of the Enugu State College of Education (Tech.), Enugu (ESCET) and Institution of Management and Technology (IMT), also in Enugu urban. The two schools were purposively chosen. The population comprised 72 students of the two institutions, 52 from IMT and 20 from ESCET who were available in class on two consecutive days the

questionnaires were distributed. It has to be recalled that the total number of final year students in the two institutions is 94, 67 from IMT and 27 from ESCET.

Data were analysed after being treated to modified Likert scale on four points. A skill is adjudged to be possessed if the level of agreement is equal to or more than 2.50. Conversely, it is assumed not possessed if lower than 2.50.

4.1 Presentation and Analysis of Results

Table 1:   Computer literacy Skills possessed by ESCET Students

S/N	ITEMS	SA	A	D	SD	$\overline{X}$
1.	I possess word processing skills	8	10	2	0	3.30
2.	I possess data processing skill	8	9	3	0	3.25
3.	I can perfectly send e-mails	14	4	2	0	3.60
4.	Receive e-mails	16	3	1	0	3.75
5.	Store and retrieve documents	12	8	0	0	3.60
6.	Browse the web	17	3	0	0	3.85
7.	Transmit data via Bluetooth device	15	3	2	0	3.65
8.	Manage a database	7	6	7	0	3.00
9.	Upload data into the internet	11	7	2	0	3.45
10.	Print documents via direct connection	9	9	2	0	3.35
11.	Print documents via wireless connection	7	5	6	2	2.85
12.	Data sharing via internet	10	7	3	0	3.35
13.	Internet access via modem	12	7	1	0	3.60
14.	Scan images onto a file	10	1	1	0	3.50
15.	Play music using a computer	17	3	0	0	3.85

From the table above, it is noted that the ESCET students are reasonably ICT competent, with document printing via wireless connection (2.85) being the least while browsing the web and playing music using the computer, each (3.85) being the highest emphasised skills.

Table 2: Information Literacy Skills possessed by ESCET Students

S/N	ITEMS	SA	A	D	SD	$\overline{X}$
1.	Always know when I have a need for information	8	7	3	2	3.05
2.	I know how to access information source s in the library without the help of staff	7	5	7	1	2.90
3.	I always know the extent of information I want	6	8	6	0	3.00
4.	These days, too much information makes it difficult for me to make an informed choice.	12	5	2	1	3.40
5.	I find it easy to evaluate my sources of information	11	6	3	0	3.40
6.	I completely believe in radio or TV adverts	9	7	1	3	3.10
7.	I know how well to apply information to solve my problems	3	4	11	2	2.40
8.	I know how to search the internet on my own	16	4	0	0	3.80

9.	I know what constitutes plagiarism and ethical use of information	4	3	11	2	2.45
10.	I can always select the main ideas from the text I read	5	11	2	2	2.95
11.	I find it easy to draw conclusions based on the information gathered	5	11	1	3	2.90
12.	I am always in a has te to explore information sources to increase familiarity with the topic I wish to write on.	7	10	3	0	3.20
13.	I easily recognize prejudice, deception or manipulation in a text	4	14	2	0	3.10
14.	I use one documentation or reference style consistently to cite sources	4	3	10	3	2.40
15.	I always cite the information source I consulted	3	4	11	2	2.40

From the table, it is discovered that the information literacy skills possessed by ESCET students is lower than their computer literacy competence. For instance, they have below average competence in their application of information to solve problems (2.40), knowledge of what constitutes plagiarism and ethical use of information (2.45), use of one documentation style consistently and the citing of information sources consulted (2.40) each. However, they exhibited high proficiency in searching the web.

Table 3: Computer literacy Skills possessed by IMT Students

S/N	ITEMS	SA	A	D	SD	$\overline{X}$
1.	I possess word processing skills	35	17	0	0	3.67
2.	I possess data processing skill	27	24	1	0	3.50
3.	I can perfectly send e ... mails	35	16	0	1	3.65
4.	Receive e-mails	33	18	0	1	3.60
5.	Store and retrieve documents	32	20	0	0	3.62
6.	Browse the web	34	18	0	0	3.65
7.	Transmit data via Bluetooth device	33	18	0	1	3.60
8.	Manage a database	14	25	12	1	3.00
9.	Upload data into the internet	13	25	13	1	2.96
10.	Print documents via direct connection	30	19	2	1	3.50
11.	Print documents via wireless connection	17	32	2	1	3.25
12.	Data sharing via internet	16	21	12	3	2.96
13.	Internet access via modem	33	16	2	1	3.56
14.	Scan images onto a file	33	18	0	1	3.60
15.	Play music using a computer	35	17	0	0	3.67

It is noted, from the table, that the students of IMT are highly proficient in word processing and the use of computer in music playing, with each 3.67. They are also highly proficient in web use, for instance, sending e-mails and web browsing received high level of acceptance of 3.65 each. They are, however, not highly proficient in data sharing via the internet and uploading data into the internet, with each 2.96 level of acceptance. They also showed low skill in database management as the data depicts.

Table 4: Information Literacy Skills possessed by IMT Students

S/N	ITEMS	SA	A	D	SD	$\overline{X}$
1.	Always know when I have a need for information	17	23	12	0	3.10
2.	I know how to access information sources in the library without the help of staff	17	21	8	6	2.94
3.	I always know the extent of information I want	15	25	12	0	3.06
4.	These days, too much information makes it difficult for me to make an informed choice.	27	24	1	0	3.50
5.	I find it easy to evaluate my sources of information	26	25	1	0	3.48
6.	I completely believe in radio or TV adverts	13	25	13	1	2.96
7.	I know how well to apply information to solve my problems	11	13	18	10	2.48
8.	I know how to search the internet on my own	42	10	0	0	3.81
9.	I know what constitutes plagiarism and ethical use of information	10	12	21	9	2.44
10.	I can always select the main ideas from the text I read	14	25	12	1	3.00
11.	I find it easy to draw conclusions based on the information gathered	18	21	13	0	3.10
12.	I am always in a haste to explore information sources to increase familiarity with the topic I wish to write on.	18	20	10	4	3.00
13.	I easily recognize prejudice, deception or manipulation in a text	20	24	7	1	3.21
14.	I use one documentation or reference style consistently to cite sources	10	12	20	10	2.42
15.	I always cite the information source I consulted	11	13	18	10	2.48

It is noted, from the table, that the IMT students, like their ESCET counterparts, are equally more proficient in computer literacy than in IL. Apart from their high ability to search the internet, other skills are poorly rated compared to their skills in computer technology.

Table 5: Grand mean of information and computer literacy skills possessed by students

Type of literacy	ESCET	IMT
Computer literacy	3.45	3.45
Information literacy	2.96	3.00

From the table, it is noted, from the grand mean that the computer literacy competence of ESCET and IMT students are equal. However, they differed in information literacy, though less significantly.

5.1 Discussion of Findings

The study revealed that ESCET students have high level of competence in web browsing and playing music using the computer. This is in line with study by Todd (2003) which stated that young people enjoy searching information on the web and are motivated to use it as a communication and entertainment tool. The study by Todd (2003) was done outside the country but this study was done in Enugu State of Nigeria. Also, the information literacy level of ESCET students

was found to be low in accordance with the study by Kuruppu and Gruber (2006), also done outside the country. For instance, they have low average competence in the application of information to solve problems, knowledge of what constitute plagiarism and ethical use of information. Their complete belief in Radio and TV adverts demonstrates their deficiency in the evaluation of information sources.

Also, the computer literacy skills of IMT students are found to be higher than their IL skills. For example, their lack of proficiency in IL is depicted in four information literacy outcomes where they are found to be very poor. These include the adequate use of information to solve problems, adequate knowledge of what constitutes plagiarism and ethical use of information, consistent use of one documentation style to cite sources, and citing of information sources consulted. Finally, the grand mean yielded by the study showed that students of Computer Science in Enugu State are more proficient in computer than in IL skills.

Conclusion

The study has successfully identified the need for both computer literacy and information literacy in library services as both would help to buoy up efficient and effective library service delivery. The computer, for instance, is very helpful in library "house-keeping" operations which ensure quality service. Also, adequate knowledge of the computer would help students use the library more efficiently and effectively in their search for information. The acquisition of information literacy by the library users would lessen the stress experienced by librarians as users would now be in a position to help themselves find information. However, the study revealed that the information literacy skills of the students studied are low. For instance, students copiously copy other authors' work without acknowledgement; they do not cite the sources consulted according to most recent documentation style in their field of study. Lecturers in high institutions would attest to the fact that most students complete assignments without showing their information sources and when forced to show these sources, they do not do that well. Also, many students do not know how to package information especially in this era of information glut. As a part-time lecturer in one of the tertiary institutions in Enugu State, Nigeria, the researcher was surprised to see that a student downloaded materials from the net and bound it without sitting down to rearrange his facts. This is a case of complete lack of information literacy.

Recommendations

Based on the findings of the study, the following recommendations are made:
1. Information literacy skills should be integrated into the curriculum.
2. Lecturers should always emphasize problem-based learning in their teaching.
3. Instructors must collaborate with librarians in order to inculcate adequate information literacy in students.
4. There should be a paradigm shift from the dominant repackaging of information for students in the form of textbooks and other media.

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