Qualitative and Quantitative Methods in Libraries (QQML) Special Issue School Library Research and Educational Resources:6: 113-133, 2017

The Important Role of School Libraries in the Development of Students Information Literacy Skills

Marios Zervas[1], Chrysanthi Stavrou[2], Alexia Kounoudes[3]

[1-3] Cyprus University of Technology Library

Abstract: The focus of this paper is on school libraries and the important role they play in the development of students' information literacy skills. Most of the students coming from the Cyprus Education System are not aware of the content of the collection and services offered by an academic library. This problem manifests itself when students proceed to the university and find themselves struggling to locate information and material at the university's library. The Cyprus University of Technology Library, having recognized this problem, undertook a research study to understand and evaluate the existing situation in the Cyprus Secondary Education System. The results of this research will be used to inform the decision makers, such as the Cyprus Ministry of Education, about the current situation and provide proposals for resolving this problem. This survey takes into consideration the current students' knowledge in media literacy, including computer, media, Internet, multimedia and information literacy skills. The results of this survey are presented in this paper together with suggestions for solutions that will enable the decision makers of the education system to improve the students' weak information literacy skills.

Keywords: Information Literacy, School Libraries, Media Literacy, ICTs

1. Introduction

Information literacy is one of the major strategic goals set by the Library and Information Services of the Cyprus University of Technology (LIS). Even from the first years of the university operation in 2007, it was observed that the students were not aware of the services offered by an academic library and the benefit those services could be to them. Therefore, the LIS organized information literacy skills development courses, in cooperation with the academic staff, which were taught during regularly scheduled class time.

Received: 19.4.2017 Accepted: 15.9.2017 ISSN 2241-1925

Through these courses it was observed that first year students have basic deficiencies in the following areas:

- Understanding what is included in the collection of an academic library,
- information literacy skills, including
- the ability to use information ethically, i.e., the correct use of information resources through citations and bibliography.

The problem lies in the fact that even though students need 21st century information literacy skills, the role of school libraries in Cyprus is so rudimentary that students starting university courses, or those who go straight into the workforce after school, are fundamentally information illiterate; hence, they are not able to access, evaluate, or effectively use information, the prerequisite to self-directed lifelong learning.

In Cyprus, the current political leaders recognize the importance of information literacy to individuals, business, and citizenship. It should be mentioned that as early as 2003, a significant effort was made to reform the educational system. In a document prepared by a committee appointed by the Ministry of Education and Culture, school libraries were included, but there was no specific reference to information literacy and the participation of school libraries in the curriculum. In this document, it was specifically mentioned that, 'Library: Computerization and library organization, based on the requirements and objectives of Lyceum. It is not accepted that in some schools, libraries are used as books warehouses, without librarians and without a library management system for borrowing books' (Ministry of Education, 2003).

Nevertheless, today most school libraries do not have an electronic catalogue and are not staffed by librarians. There is no specific reference to the role of the librarian in the development of the students' skills in information literacy or to the collaboration between librarians and teachers. Also, there is no specific reference to the development of information literacy skills for teachers.

Additionally, a program called Illiteracy in Primary Education has been firmly established in the education system of Cyprus, after being successfully launched nationwide in 2007 by the Centre of Educational Research and Evaluation. This program is aimed at the early identification of students with a high probability of remaining functionally illiterate throughout the various stages of compulsory education, to provide appropriate interventions. The program makes no reference to information literacy (Centre of Educational Research and Evaluation (CERE, 2012).

In the age of electronic information, information is disseminated in different formats (text, audio, image, video) through different media including social networks, and users are required to have the necessary knowledge and skills (computer, Internet, multimedia, information literacy skills) to 'survive' in the information society.

1.1 Purpose of the Study

The study investigated the information behaviour of potential undergraduate students. The purpose of the research was to create guidelines for the Cyprus Education System to facilitate the development and implementation of an information literacy program to help undergraduate students become 'information independent' so that upon their integration in the society they are critically thinking citizens and active members of the civil society (Literacy, 2004).

1.2 Research Questions

R1. Do the potential undergraduate students have the knowledge and information literacy skills necessary to access requested information, evaluate it and use it effectively?

R2. Is there a relationship between the potential undergraduate students' level of knowledge of the Greek and English languages and information technology, mathematics, media and information literacy?

R3. Do the potential undergraduate students' information literacy skills improve after the intervention?

1.3 Limitations of the Study

The level of knowledge of students in computers, media, and Internet was based on the students' personal assessments and was not measured by specific questions.

1.4 Assumptions

It was assumed that the students who were surveyed answered the questions forthrightly and impartially.

1.5 Importance of the Study

This results of this study will provide information about the role that school libraries can play in the development of information literacy skills, the staffing of school libraries and the need for cooperation between school librarians and teaching staff.

2. Literature Review

2.1 Concepts

Various concepts related to information literacy are being used in the international literature. David Bawden (2001) summarizes the terms: Computer Literacy, Information Technology Literacy, E-Literacy, Library Literacy, Network Literacy, Internet Literacy, Hyper-Literacy, Multimedia Literacy, Media Literacy, Web Literacy, Digital Literacy.

Horton (as cited in Lau, 2006), defines Computer Literacy as 'the knowledge and skills necessary to understand information and communication technologies (ICTs), including the hardware, the software, systems, networks (both local area networks and the Internet), and all of the other components of computer and telecommunications systems'. Media Literacy as 'the knowledge and skills necessary to understand all of the mediums and formats in which data, information and knowledge are created, stored, communicated, and presented, i.e., print newspapers and journals, magazines, radio, television broadcasts, cable, CD-ROM, DVD, mobile telephones, PDF text formats, and JPEG format for photos and graphics'.

Based on UNESCO, Media and Information Literacy (MIL), (UNESCO, 2013) is made up of the following different concepts connected to each other and included in the wider concept of MIL: Computer Literacy, Digital Literacy, Freedom of Expression, Freedom of Information Literacy, Information Literacy, Internet Literacy, Library Literacy, Media Literacy, News Literacy.

This study has adopted the term MIL since the survey includes four elements of MIL: Computer Literacy, Internet Literacy, Media Literacy and Information Literacy, and the term of Information Literacy as the research focuses mainly on this issue.

School libraries evolve and adapt to the technological trends of each season and as demonstrated through studies, they have a key role in shaping information literate students. In a study on the contribution of school libraries, the findings, both quantitatively and qualitatively, showed that effective school libraries help students in their studies in many ways at different levels of education and play an active rather than passive role in student learning (Todd & Kuhlthau, 2004). UNESCO, through its efforts to assist in developing the information literacy skills of students worldwide, has issued many guides about information literacy. IFLA published the School Library Guidelines (Lau, 2006) with the following instruction: 'Governments, through their ministries responsible for education, are urged to develop strategies, policies and plans that implement the principles of this Manifesto'.

ALA published a report on information literacy which resulted in instructions to the American society to reap the benefits of the Information Age, both the citizens and the businesses (American Library Association, 1989). ALA, having realized the importance of information literacy and having understood that it is a survival skill in the Information Age, states that, 'Instead of drowning in the abundance of information that floods their lives, information literate people know how to find, evaluate, and use information effectively to solve a particular problem or make a decision---whether the information they select comes from a computer, a book, a government agency, a film, or any number of other possible resources'.

In ALA's report, there are six directives to the American society demonstrating the importance shown by United States bodies, stating that the country will reap

the benefits of the information age, as well as the citizens and the businesses. Among others some of the instructions state:

1. 'A Coalition for Information Literacy should be formed under the leadership of the American Library Association, in coordination with other national organizations and agencies, to promote information literacy…'
2. 'Teacher education and performance expectations should be modified to include information literacy concerns. Inherent in the concepts of information literacy and resource-based learning is the complementary concept of the teacher as a facilitator of student learning rather than as presenter of ready-made information. To be successful in such roles, teachers should make use of an expansive array of information resources. They should be familiar with and able to use selected databases, learning networks, reference materials, textbooks, journals, newspapers, magazines, and other resources…' (American Library Association, 1989).

The education of teachers in information literacy and the collaboration between librarians and teachers to plan and implement information literacy programs are considered important factors in the success of school libraries which, as evidenced, play an important role in student achievement. In 2004, the Australian Library and Information Association (ALIA) and the Australian School Library Association (ASLA) promoted a statement of standards of professional excellence for teacher librarians (Australian Library and Information Association (ALIA) and the Australian School Library Association (ASLA), 2014). This document is intended for use as a framework for ongoing professional learning. In 2012, ASLA promoted a national approach for the voluntary education of teacher librarians. The purpose was to promote quality teaching. In a continuous way, ASLA revised 'Statement on Teacher librarians in Australia', which describes and promotes the role of the teacher librarian (Australian School Library Association, 2014).

2.2 The Contribution of UNESCO to Information Literacy

The contribution of UNESCO to information literacy and lifelong learning is crucial. In 1999, UNESCO in collaboration with IFLA issued a very important manifest, 'IFLA / UNESCO School Library Manifesto' (IFLA/Unesco, 1999), setting out amongst others the mission, the objectives and the role of school libraries. Through the manifest it is emphasized how important the cooperation between teachers and librarians is for the students' success in their studies and the development of information literacy skills, while highlighting the educational role of the librarian. The manifest concludes that governments, through the ministries responsible for education, are invited to develop strategies, policies and programs that apply the principles of this Manifest. These programs should include the initial and continuing training of librarians and teachers.

In 2005, UNESCO in cooperation with IFLA and the 'National Forum on Information Literacy' (NFIL), organized a workshop on information literacy and lifelong learning in Alexandria, which resulted in a proclamation (Alexandria Proclamation on Information Literacy and Lifelong Learning), which describes information literacy and lifelong learning as 'beacons of the Information Society', illuminating the courses to development, prosperity and freedom. Information literacy empowers people in all walks of life to seek, evaluate, use and create information effectively to achieve their personal, social, professional and educational goals. This is a basic human right in a digital world, which promotes social inclusion in all nations (Unesco, 2005).

To promote information literacy, the contribution of teachers is very important. It has been observed that teachers lack the necessary skills in Media and Information Literacy. For this reason, in 2011 UNESCO published a study guide for the teachers on Media and Information Literacy. The preparation of this guide was part of a comprehensive strategy for building societies in Media and Information Literacy (Wilson, Carolyn; Grizzle, Alton; Tuazon, Ramon; Akyempong, Kwame; Cheung, 2011).

After that, UNESCO (Lee, Lau, Carbo, & Gendina, 2013) published the report 'Conceptual Relationship of Information Literacy and Media Literacy in Knowledge Societies'. The purpose of this report was to investigate the education and skills needed for citizens, communities and nations to participate in future knowledge societies. The Assessment Framework MIL provides to the Member States of UNESCO assessment tools to enable them to assess the extent to which the country is ready and able to provide citizens with the necessary MIL skills (UNESCO, 2013).

With the promotion of the school libraries guide (IFLA/Unesco, 2000), IFLA gives a clear picture of the role of school libraries and the cooperation between school librarians and teachers. UNESCO gives great emphasis through the manifest, reports, assessment tools on the standards of information literacy from the members and initiatives for the promotion of information literacy to all the sections of the population, speaking clearly about the information society. It is clear to see how important the role of school libraries and the collaboration of librarians with teachers on students' information literacy are. UNESCO talks about media and information literacy (MIL) incorporating other concepts of information literacy, taking into account technological developments where knowledge is provided through different means. UNESCO goes further by issuing guides for assessment and teacher education in media literacy and information (Wilson, Carolyn; Grizzle, Alton; Tuazon, Ramon; Akyempong, Kwame; Cheung, 2011).

3. Methodology

3.1 Tools and Process Procedure of the Survey

For the preparation of the questionnaire, international references were used to identify questionnaires used in research related to information literacy, such as the questionnaire used in the survey for first year students at the University of Quebec, Canada (Archambault, Carrier, Grant, Guilmette, & Healy, 2003), the questionnaire used by Debbie Campbell Millikin at the University of Illinois in the United States (Campbell, 2009), the questionnaire of Rodney Marshall at the Eastern Illinois University (Marshall, 2006) and the questionnaire that is included in the article of Jose Rodriguez Conde of the University of Salamanca, Spain. (Rodríguez Conde, Olmos Migueláñez, Pinto Molina, Martínez Abad, & García Riaza, 2011)

For the design of the questionnaire, the following questions were answered and steps followed:

1. What kind of information should be collected according to the research objectives set?
2. Who will collect the questionnaires?
3. What method will be used to collect the questionnaires?

Two questionnaires were created, the pre-test and the post-test. The pre-test questionnaire includes questions divided into six categories: demographic data via dichotomous questions, level of knowledge in core subjects through multivariate measurement scales, knowledge in computing, the Internet, media and information literacy skills through dichotomous questions and multivariate measurement scales. In most questions the respondent is asked to judge the level of his knowledge through multivariate measurement scales. Only in basic questions of information literacy is the respondent being asked to choose the correct answer through multiple choice questions. The second questionnaire, the post-test, does not include questions about knowledge in computer, Internet and multimedia.

For the purpose of the survey, an intervention was designed that takes place after the completion of the first questionnaire and before the completion of the second. The intervention lasting forty-five (45) minutes was given separately in all the classes of students surveyed, with the help of a PowerPoint. During presentations, the four information literacy skills were demonstrated through examples. More specifically, the terminology, what constitutes the collections of academic libraries, search techniques to find books, articles, search strategies in databases using thesaurus, and search strategies using Boolean operators were explained. Additionally, information about Internet source evaluation for the identification of books and scientific articles was also explained. Finally, plagiarism was explained and the importance of citing sources.

The questionnaire covered four aspects of Media Literacy (information literacy, computer literacy, internet literacy and media and information literacy).
The first questionnaire attempted to establish:

- Whether students have a personal computer and Internet access - if students use the library.

- The performance of the students in Greek lessons, mathematics, English and IT.
- The level of the students' knowledge in terms of the Internet, computers, social networks, multimedia, etc.
- Whether students have information literacy skills.

For questions regarding information literacy, answers were specific; in this way, a limit is placed on the options processing and the utilization of statistical data. Nevertheless, because the presentations were designed mainly for the skills of information literacy with specific options for the replies, the ability to draw more precise conclusions is given. For other aspects in media and information literacy, the questions were rated enabling better data processing; however, it was observed that many students chose the easiest answer, which was in the middle of the scale. In the questions related to media and information literacy, students answered based on their own assessment of the level of their knowledge so the validity of the results lies in the students' honesty.

In the second questionnaire, the survey focused on issues of information literacy, which were explained during the presentations. For the completion of the questionnaire, it was decided that the questionnaire would be given by hand before the lesson was conducted on information literacy. The electronic completion of the questionnaire by the students on their own PCs at home, or in the computer rooms of schools, was considered an unsatisfactory solution because of the possibility that a large percentage of the students might not complete it; therefore, no satisfactory sample could be collected.

The first pre-test questionnaire was compulsory, completed by all the students in the classes surveyed. Some questionnaires were not satisfactorily completed; therefore, they were removed from the list. Then, lectures were conducted in all the classes. No later than one week after the lectures, all the students who had attended the lectures had to compulsory answer the second post-test questionnaire. Students who were not present for the lectures were not included, since the survey was intended to establish whether there was a variation in the students' answers after attending lectures.

3.2 Participants

Two high schools were selected that the researchers had easy access to: Kolossi Limassol District High School and Archbishop Makarios Dasoupoli Nicosia District High School. The completion of the questionnaire was compulsory for all students in the first and third grade. It should be noted that secondary school in Cyprus has three (3) grades.

At the Kolossi High School, the first pre-test questionnaire was completed by two hundred seventy-five (275) students from seven (7) classes of the third grade and six (6) classes of the first grade. After that, thirteen (13) forty-five (45) minute lectures were subsequently carried out from the 13th of October

2014 until the 17th of October 2014. After the lectures, the second questionnaire (post-test) was completed by two hundred forty-three (243) students.

At Dasoupolis High School, the first pre-test questionnaire was completed by two hundred fifty (250) students from seven (7) third grade classes and four (4) first grade classes. After that, eleven (11) forty-five (45) minute lectures were carried out between 11th of June 2014 through 17th of November 2014. After the lectures, the second questionnaire (post-test) was completed by two hundred fifty (250) students.

Based on the Statistical Office of the Ministry of Education and Culture, six thousand four hundred eighteen (6418) students attended the first grade and six thousand six hundred eleven (6611) students attended the third grade nationwide during the 2014-15 school year.

The total number of students in the first grade at the selected high schools who answered the questionnaire was two hundred twenty (220), which is 3.4 percent nationwide. The total number of students in the third grade at the selected high schools who answered the questionnaire was three hundred five (305), which is 4.6 percent nationwide.

3.3 Conducting Process of the Survey

Initially, the questionnaire was given for control and evaluation to the librarians of the Cyprus University of Technology Library, and then to high school students. In this way, any obscure points of the questionnaire were improved.

3.4 Data Analysis

For the statistical analysis of the data, all questionnaires were run using SPSS and after any incomplete replies were removed, four hundred ninety-four (494) questionnaires remained. The replies from the post-test questionnaire were placed in post; in this way, the results between the first and the second questionnaire were distinguished.

4. Results

4.1 Students' characteristics

The questionnaire was answered by one hundred ninety-four boys (39%) and two hundred ninety-nine girls (61%).

Ninety-one percent (91%) of the students answered that they have a personal computer and ninety-five percent (95%) responded that they can access the Internet from home. For the most part, students scored higher in the IT course than in other courses. Girls performed better than their male counterparts in the IT course (Table 1, Table 2).

The majority of the students (61%) had never visited the school library and thirty-three percent (33%) rarely visited the library. Three percent (3%) visited

the school library one to three times per month and another three percent (3%) visited the library one to three times per week. Moreover, visiting the library's website only shows a slight increase in relation to a physical visit to the library, with rates of never (34%), rarely (42%), 1-3 times per month (11%), 1-3 times a week (6%), and daily (7%).

Table 1: Grades of male students in main subjects

	Mathematics	Greek Modern	English	IT
Excellent	14%	15%	42%	55%
Very Good	36%	34%	29%	21%
Good	28%	38%	24%	19%
Almost good	18%	13%	4%	2%
Failure	4%	1%	3%	3%

Table 2: Grades of female students in main subjects

	Mathematics	Greek Modern	English	IT
Excellent	27%	24%	51%	65%
Very Good	37%	47%	35%	24%
Good	26%	25%	9%	8%
Almost good	10%	4%	3%	3%
Failure	1%	0%	1%	0%

4.2 Information Literacy Skills - Finding Information

In the tables below, it can be observed that students attending the lectures have improved their information literacy behavior in some areas. Improvements can be seen in the results of the pre-test in relation to those of the post-test. Specifically, in Table 3 for the Boolean operators, there were 17.4 percent correct answers in the pre-test compared to 29.8 percent in the post-test. In Table 4, there is an increase from 23.1 percent correct answers to 25.2 percent correct answers on the catalogue searching.

In Table 5, the correct answers on familiarity with a topic increased from 5.3 percent correct to 28.7 percent correct. In Table 6, on the topic of the identification of the most recent information, 1.6 percent of the answers are correct on the pre-test as compared to 10.1 percent on the post-test. The answer on the Internet, which was chosen by 87 percent in the pre-test is reduced to 70.9 percent on the post-test, which indicates that some students were influenced by the lectures.

In Table 7, questions about searching databases with accurate terminology moved from 3.2 percent in the pre-test to 22.7 percent in the post-test. Finally, in Table 8, regarding the identification of information about the price of gold, 38.7 percent of the answers are correct in the pre-test compared to 43.7 percent in the post-test. This indicates that the lectures conducted between the two questionnaires may have resulted in improvements in the students' knowledge, at least occasionally.

Table 3: Use of Boolean operators

To find more results on a topic, more keywords are used. Which of the following Boolean operators you are going to use?				
	PRE-TEST		POST-TEST	
AND	273	48%	239	48%
NOT	9	2%	19	4%
OR	86	17%	147	30%
Other	91	18%	69	14%
No response	71	14%	20	4%

Table 4: Search in Library Catalogue

To find books in a library catalog you are going to search with:				
	PRE-TEST		POST-TEST	
Title	303	61%	281	57%
Publisher	7	1%	18	4%
Subject	114	23%	125	25%
Author	46	9%	38	8%
Other	22	5%	25	5%
No response	2	0.4%	7	1%

Table 5: Getting familiar with a subject

To become familiar with a subject you are going to search:				
	PRE-TEST		POST-TEST	
Journal	10	2%	22	5%
Encyclopedia	26	5%	142	29%
Database	9	2%	20	4%
Book	13	3%	29	6%
Internet	424	86%	257	52%
Other	13	2%	13	3%
No response	1	0.2%	11	2%

Table 6: Finding information about information technology

To locate the latest information on information technology which of the following resources you will search?				
	PRE-TEST		**POST-TEST**	
Dictionary	6	1%	16	3%
Journal*	8	2%	50	10%
Encyclopedia	10	2%	35	7%
Internet*	430	87%	350	71%
Other	36	7%	33	7%
No response	4	1%	10	2%

Table 7: Searching in Databases

When searching in a database it is useful to use the exact terminology. From where will you find it?				
	PRE-TEST		**POST-TEST**	
Dictionary	45	9%	114	23%
Thesaurus*	16	3%	112	23%
An internet Search engine	368	75%	227	46%
Other	48	10%	36	7%
No response	17	3%	5	1%

Table 8: Finding information in specific resources

To find the most recent information about the price of gold from which resources will you search?				
	PRE-TEST		**POST-TEST**	
Books	45	9%	35	7%
Articles	29	6%	46	9%
Government web pages	32	7%	46	9%
Encyclopedia	33	7%	35	7%
Bank websites*	191	39%	216	44%
Don't Know	159	32%	101	20%
No response	5	1%	15	3%

4.3 Internet and Social Networks Education

The questions concerning the level of knowledge students have on issues about the Internet and social networks indicate that students feel that they have a very good knowledge. More than 80 percent of the students believe that they know and use search engines to locate information sources, and that they know how to interpret the results and retrieve information from the Internet. In particular,

based on the mean value (Mean), it appears that students know how to search, retrieve and interpret the results from the Internet with a standard deviation between 1,044 and 1,308. They also appear to know how to use social networks with Facebook being first. Ninety-one percent (91%) of the students responded that they know it very well, followed by Google (83%), then Twitter (39.1%), and finally the professional network LinkedIn, which only 14.6 percent of the students were familiar with; a finding that is considered reasonable since LinkedIn is a professional network. Students use the Internet and social networks. This is a fact, which must be used by libraries as a means of communication with young people.

Table 9:

Internet and social networks knowledge	**Mean**	**Std. Deviation**
Using search engines to locate information resources	1,84	0,969
Understanding search results through search engine (e.g. Google)	1,45	1,044
Search and retrieve information from the Internet	1,41	1,308
Social Media:		
Blogs	2,91	1,511
Facebook	1,32	0,842
Google+	1,6	1,151
Twitter	3,11	1,57
LinkedIn	4,21	1,291
Presentation of information in Blogs, Webs, etc.	3,34	1,405

Values: Excellent (1), Very good (2), Good (3), Almost good (4), Failure (5)

4.4 Computer and Multimedia Literacy

In total, students state that they know Microsoft software programs (Word, Excel, Access, PowerPoint) very well. Specifically, 86.4 percent say they know Word very good to excellent, 65.6 percent claim to know Excel software from very good to excellent, 54.6 percent of the students say that they know Microsoft Access very good or excellent, and 80.6% of them say they know PowerPoint very good or excellent. Additionally, they claim to know useful tools such as YouTube (Table 11), important during their studies in secondary, and especially in tertiary education for the processing of operations, and then in the workplace.

Table 10: Level of use of computer applications

	Word	Excel	Access	Power Point
Mean	1,51	2,1	2,45	1,7
Std. Deviation	0,908	1,087	1,305	1,066

Values: Excellent (1), Very good (2), Good (3), Almost good (4), Failure (5)

Table 11: Multimedia Literacy

Actions	Yes%	No%	Not sure%
Online software download and installation	62	11	**27**
Install a program to the computer	75	7	18
Transfer music from a computer to an mp3 player	87	6	7
Upload a video to You Tube	62	21	18
Preparation of PowerPoint presentation using images, sound, text, video	80	6	14
Download information from a mobile device or a camera to a computer	88	5	6

4.5 Information Literacy Skills - Evaluation of Information

The evaluation of information is one of the four skills of information literacy. From the results, a large percentage (28.5%) agree that information identified in the Internet is confusing and they are not confident that they can use it. Additionally, 34 percent are not sure whether the information is accurate. However, 33.3 percent think that they are certain about the quality of the information collected by the information sources.

Table 12: Evaluation of information

When I find information on the internet…	Mean	Std. Deviation
… it is so confusing that I'm not sure that I can use it	3,87	1,289
… I am not sure that it is correct	3,21	1,06
…I am sure that it responds to my work	3,32	1,079
…I am sure for the quality of information resources	3,15	1,026

Values: Strongly Disagree (1) Disagree (2) Not sure (3) Agree (4) Strongly Agree (5)

4.6 Information literacy skills - Use of Information

Results indicate 55.7 percent of the students are confident that their projects answer the questions; 58.2 percent state that when they are using information from the Internet they know that there are copyright issues involved; 53.2 percent of the students state that when they are using Internet sources they make reference to their sources. It was observed that in all three questions, the average (mean) is more than 3.5 i.e., the answers lie between 'I'm not sure' to 'I agree' with a standard deviation of 1.079 to 1.308 (Table 13).

Table 13: Use of Information

	Mean	Std. Deviation
Are you sure that your project is answering inquiries	3,59	1,079
When using information from the internet you know that there are copyrights	3,77	1,291
When using information, you make references to the copyright owner	3,59	1,308

Values: Strongly Disagree (1) Disagree (2) Not sure (3) Agree (4) Strongly Agree (5)

4.7 Regression Analysis

Regression analysis was performed to examine whether the knowledge on social networks (Blogs, Facebook, Google+, and Twitter) and the programs of Microsoft (Word, Excel, PowerPoint and Access) are influenced by the level of students in Mathematics, English, Modern Greek and IT. In several cases, the index R2 is less than 0.20 so there is no correlation. One of the cases where there is a low correlation is on the information technology course where the affinity ratio of the two variables Pearson r, which in the case of the tables is ranging from 0.456 to 0.482, indicates a moderate correlation in the degree in information technology with the MS office software. The coefficient (R Square) in this finding suggests that if you know the level of knowledge of students in MS office programs you can understand the performance of students in information technology by 22 percent.

Table 14: Dependent variable degree in Information technologies

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,456[a]	,208	,206	,804
2	,478[b]	,229	,225	,795
3	,478[c]	,229	,223	,796
4	,482[d]	,232	,225	,795

Significance Degree

The following questions which existed in both questionnaires and whose responses were classified from 'I do not agree' to 'I fully agree', the method 'correlate t-test' was used to identify any difference that has statistical significance.

Q1. When you locate information on the Internet it is often so confusing that you're not sure that you can use them

Q2. The information that you find on the internet you are often not sure that it is accurate

Q3. You are sure that the information you find in the information sources correspond to your work

Q4. You are sure of the quality of the information resources you locate online

Q5: you are sure that your projects answer the questions

Q5. When you are using information from the internet you are aware that there are copyrights

Q6. When you are using information from information sources, you make reference to the copyright owner

Table 15: Descriptive Statistics and t-test Results for Q1-Q7

	Pretest		**Posttest**			**95% CI for Mean Difference**			
Outcome	**M**	**SD**	**M**	**SD**	**N**		**DF**	**T**	**P(Sig 2 tailed)**
Q1	2,91	1,099	3,02	1,120	480	-.249, .36	479	-1,467	,143
Q2	3,32	1,096	3,20	1,061	479	-.017, .250	478	1,720	,086
Q3	3,30	1,059	3,32	1,077	481	-.157, .115	480	-,301	,764
Q4	3,05	1,041	3,15	1,024	480	-.233, .033	479	-1,476	,141
Q5	3,57	1,041	3,59	1,076	481	-.166, .108	480	-,416	,677
Q6	3,88	1,281	3,76	1,294	480	-.053, .286	479	1,352	,177

Q7	2,93	1,473	3,59	1,304	476	-.832, -.479	475	-7,299	,000

* p < .05.

In most cases, the difference between the two questionnaires was not statistically significant except for question Q7. Specifically, in question Q7, the average response in pre-test before the lectures was 2.93 with St. dev = 1,473 and after the lectures was 3.59 with St. dev = 1,304, therefore the difference is 0.66. In the question regarding whether the students refer to the copyright holder, the 95 percent confidence interval of the difference is -0.832 to -0.479. Since the confidence interval does not contain the 0.00, the difference is statistically significant at two-tailed 5 percent level. This finding illustrates the students' speculation created from the lectures on copyright.

5. Conclusion

Almost all students have a personal computer and Internet access. The level of Cypriots students' knowledge in core subjects is high. Additionally, students say they have a very good knowledge in computers, multimedia, Internet and social networks covering in education level their skills in Computer, Internet and Media Literacy, a fact that is a positive condition to develop information literacy skills.

Students do not use the school libraries and they are not aware of basic concepts used in libraries and they do not have developed skills of information literacy.

There was a relative improvement in the results of information literacy between the first and second questionnaire, which can be attributed to the course attended by the students in the framework of this survey.

As demonstrated through the results of the survey based on the answers given by those students, they have very good knowledge in computer literacy, Internet literacy and media literacy.

The results of this study indicate a lack of understanding of the concept of information literacy (to know how to access, evaluate and use information effectively and efficiency). The first year of university study is a particularly critical and important period for the understanding and development of information literacy and research skills. Exposure to these skills early on enables students to gain proficiency over time.

This survey showed that there was a relative improvement in the results between the pre-test and post-test mainly on issues presented in the lectures, which were intermediate between the two tests where the choices in the questions were specific. In the questions where there was a rating from 'I fully agree' to 'I do not agree' there was no differentiation between the first and second

questionnaire, which is probably due to the fact that students tended to answer somewhere in the middle.

Through statistical regression analysis, it was found that there is no correlation between the level of courses and educational means. This is probably due to the fact that almost every student has a computer.

The results of the survey indicate that the level of knowledge of the students in core subjects such as Greek, English, and IT has a low correlation with the level of students in basic skills for various literacies.

Except to the issues presented in the lectures and which differentiated the results in the second questionnaire, there were no significant changes.

It was definitely not expected that through a lecture students would improve all the skills to be considered information literate. This improvement will occur over time through the upgrading of the role of school libraries and the integration of the school librarian in the educational process, through the improvement of the perception of the teachers for the role they can play in school libraries in the field of education through the improving of the information literacy skills, computer, Internet and media literacy skills of the teachers. Furthermore, the survey confirmed that the students do not use school libraries or library websites, something that should bring the relevant bodies into action.

The Cyprus University of Technology Library will attempt to upgrade the role of school libraries and to promote the cooperation of the school librarian with the teaching staff of secondary education. A presentation to the Ministry of Education and Culture of Cyprus will follow to give the research findings and recommendations for the staffing of school libraries with librarians getting their education from the pedagogical institute to become librarians-instructors, as well as the training of other teachers in information literacy topics in order to master the four skills of information literacy and incorporate them into their curriculum.

The Cyprus University of Technology Library will also proceed to specific actions within the University. This effort will focus in the continuous improvement and promotion of the information literacy program Ichnilatis[1] and the preparation of a proposal to the authorities of the University for the integration of a library course in the University's undergraduate curriculum.

[1] http://ihnilatis.cut.ac.cy/, page under development

6. Limitations and Future Research

The level of knowledge of students in computers, media, and the Internet was based on the students' personal assessments and was not measured by specific questions.

Although four hundred ninety-four (494) students took part in the survey, the sample was large enough for the entire population of secondary education. The sample needed for a population of 25,000 is 378[2]. However, it is not possible that the results reflect the overall picture of secondary education since the sample did not cover the whole Cyprus territory and it was not random.

During the presentations in which teachers were present, it was observed that the students are very rarely asked to use references in their work. Even though the students claimed that they can use Microsoft word very well; conversations with them revealed that they did not know that Word has the ability to add citations and bibliography to their documents. It was ascertained that a lot of future research must be done with specific questions in order to determine the actual level of the students' computer literacy. The absence of librarians from the school libraries is verified, since a librarian could train students and teachers in using the library.

The survey will continue with the secondary school teachers in order to determine the level of information literacy of the teachers. The survey will include, in addition to information literacy, computer and media literacy. Additionally, the research could be extended across the island using a random sample with specific questions with scale-level answers.

References

American Library Association. (1989). *American Library Association. Presidential Committee on Information Literacy. Final Report.* Chicago. Retrieved from http://www.ala.org/ala/mgrps/divs/acrl/publications/whitepapers/presidential.cfm

Archambault, C., Carrier, P., Grant, S., Guilmette, P., & Healy, É. (2003). *Information Literacy : Study of Incoming First-Year Undergraduates in Quebec*. *Library*. Retrieved from http://www.crepuq.qc.ca/documents/bibl/formation/studies_Ang.pdf

Australian Library and Information Association (ALIA) and the Australian School Library Association (ASLA). (2014). Standards of Professional Excellence for Teacher Librarians. Retrieved from http://www.alia.org.au/policies/teacher-librarian.standards.html

Australian School Library Association. (2014). Statement on Teacher Librarians in Australia. Retrieved from http://www.asla.org.au/policy/teacher-librarians-Australia.aspx

[2] http://www.research-advisors.com/tools/SampleSize.htm

Bawden, D. (2001). Information and digital literacies: A review of concepts. *Journal of Documentation*, *57*(2), 218 – 259.

Campbell, D. (2009). *Student Learning in Library Research Instruction for Critical Writing, Reading and Research I & II* (pp. 1–17). Retrieved from https://www.millikin.edu/staley/services/instruction/Documents/08-09CWRRreport.pdf

Centre of Educational Research and Evaluation (CERE). (2012). Program of Functional Literacy. Retrieved from http://www.pi.ac.cy/keea/literacy/index.html

IFLA/Unesco. (1999). *IFLA/UNESCO School Library Manifesto*. Retrieved from http://www.ifla.org/publications/iflaunesco-school-library-manifesto-1999

IFLA/Unesco. (2000). *The IFLA/UNESCO School Library Guidelines* (p. 24). Retrieved from http://www.ifla.org/publications/node/916?og=52

Lau, J. (2006). *Guidelines on Information Literacy for Lifelong Learning*. *IFLA*. Retrieved from http://www.ifla.org/files/assets/information-literacy/publications/ifla-guidelines-en.pdf

Lee, A., Lau, J., Carbo, T., & Gendina, N. (2013). *Conceptual relationship of information literacy and media literacy in knowledge societies: Series of research papers* (pp. 76–89). Paris: Unesco. Retrieved from http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/CI/CI/pdf/wsis/WSIS_10_Event/WSIS_-_Series_of_research_papers_-_Conceptual_Relationship_between_Information_Literacy_and_Media_Literacy.pdf

Literacy, A. and N. Z. I. for I. (2004). *Australian and New Zealand information literacy framework: principles, standards and practice*. (A. Bundy, Ed.)*Principles, standards and practice* (Vol. 2). Adelaide: Australian and New Zealand Institute for Information Literacy. Retrieved from http://www.literacyhub.org/documents/InfoLiteracyFramework.pdf

Marshall, R. K. (2006). An instrument to measure information competency. *Journal of Literacy and Technology*, *6*(217), 1–27.

Ministry of Education. (2003). Educational reformation. Retrieved from http://www.refernet.org.cy/images/media/assetfile/EkpedeftikiMetarrithmisi.GR[2].pdf

Rodríguez Conde, M. J., Olmos Migueláñez, S., Pinto Molina, M., Martínez Abad, F., & García Riaza, B. (2011). Informational literacy and information and communication technologies use by secondary education students in spain: A descriptive study. *Contemporary Issues in Education Research (CIER)*, *4*(4), 1–12. Retrieved from http://gredos.usal.es/jspui/handle/10366/124290

Todd, J. R., & Kuhlthau, C. C. (2004). *Student learning through Ohio School Libraries: Background, methodology and report of findings*. *Ohio Educational Library Media Association (OELMA)*. Ohio. Retrieved from http://webfiles.rbe.sk.ca/rps/terrance.pon/OELMAReportofFindings.pdf

Unesco. (2005). Beacons of the Information Society: The Alexandria Proclamation on Information Literacy and Lifelong Learning. Retrieved from http://www.ifla.org/publications/beacons-of-the-information-society-the-alexandria-proclamation-on-information-literacy

UNESCO. (2013). *Global Media and Information Literacy (MIL) Assessment Framework: Country Readiness and Competencies* (p. 150). Paris: Unesco. Retrieved from http://www.uis.unesco.org/Communication/Documents/media-and-information-literacy-assessment-framework.pdf

Wilson, Carolyn; Grizzle, Alton; Tuazon, Ramon; Akyempong, Kwame; Cheung, C. K. (2011). *Media and information literacy curriculum for teachers* (p. 192). Paris. Retrieved from http://unesdoc.unesco.org/images/0019/001929/192971e.pdf