A Study on Pre-Service Teachers' Information Literacy Abilities

Bayram Akarsu
School of Education Erciyes University Kayseri / Turkey

Email: bakarsu@erciyes.edu.tr

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Abstract

Every teacher candidates no matter what disciplines of teaching they study is supposed to acquire information literacy in order to enhance his/her future teaching activities and create more enjoyable atmosphere for the students. The present study investigates what levels of knowledge pre-service teachers enrolled in science education and primary school teacher preparation programs possess regarding information literacy. The participants (N=144) were asked to complete the Information Literacy Questionnaire for Pre-service Teachers (ILIPT). Comparison between students' information literacy levels in two different teacher preparation programs and potential causes are explicitly examined. The outcomes of this investigation revealed that even though pre-service teachers possess adequate knowledge of information literacy, they still lack some of its aspects.

Keywords: Information literacy, science education, early childhood education.

Resumen

Todo candidato a la docencia, sin importar la disciplina a enseñar, debe estar alfabetizado en el campo de la información para poder mejorar sus actividades de enseñanza futuras y crear una atmosfera más agradable para sus alumnos. El presente estudio investiga los niveles de alfabetización informacional que poseen los profesores en formación de los programas de Enseñanza de las Ciencias y de Educación Primaria. Los participantes (N=144) completaron el Cuestionario Alfabetización Informacional para Profesores en Formación (ILIPT). Comparaciones entre los niveles de alfabetización informacional de alumnos de los dos diferentes programas y las causas potenciales son examinados explícitamente. Los resultados de esta investigación revelaron que aunque los maestros en formación poseen conocimiento adecuado de manejo de la información, aun carecen de algunos de sus aspectos.

Palabras clave: Alfabetización informacional, formación para enseñanza de las ciencias, educación primaria.

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I. INTRODUCTION

Elementary teachers holding adequate levels of information literacy has been emphasized as an essential characteristic by European Union (EU) educational reforms and United States library association [1, 2]. Being an information illiterate teacher negatively affects students' learning at various levels of education. The world changes fast so it is sometimes problematic for everybody to acquire new information from outside. This creates new types of problems for people especially teachers [3]. 20th century was known as 'Information Age' and 21st century is 'Information Processing Age' but in order to develop into an information literate person, one needs to own sufficient amount of information to process.

The term information literacy, sometimes referred to as information competency, is commonly defined as the ability to access, evaluate, organize, and use information from a variety of sources. Being an information literate person requires knowing how to clearly define a subject area of investigation; selecting the appropriate terminology that expresses the concept or subject under investigation; formulating a search strategy that takes into consideration different sources of information and the variable ways that information is organized; analyze the data collected for value, relevancy, quality, and suitability; and subsequently turning information into knowledge [1]. It consists of a deeper knowledge of how and where to find information, how to judge whether that information is meaningful, and ultimately, how to incorporate information to address the problem or issue at hand. Information literacy has further definitions such as "The ability to access, evaluate, organize, and use information in order to learn, problem-solve, make decisions in formal and informal learning contexts, at work, at home and in educational settings" [4] and skills to collect, evaluate, organize, and present information [5].

The demand to evaluate the credibility of information is not new. However, until recently most learners could expect to handle some carefully selected collections of reference materials in academic and public libraries. Furthermore, today a fairly limited range of widely is accepted authoritative texts in the classroom or in the home library.

On the other hand, since anyone can make a Web page, for example, how can you tell if the information is reliable or not? A critical point about using the Internet is that individuals posting information are not required to pass through traditional editorial constraints or undergo any kind of fact-checking required in conventional published print media [6, 7]. The lack of enthusiasm to look for information from tried and true sources such as well-indexed books or the temptation to assign value to information simply because it came off of the computer will likely provide results with poor quality.

Not only must we be discerning learners but also we must be constantly learning. As global change pace has increased, so has our need for learning. Consider the tremendous changes in both the amount and variety of information resources, as well as great changes in technology that affects our lives in everything from banking to medical care. Change requires that we know more and learn more about the world around us. Yet several scholars such as Breivik and Jones [8] have found that the traditional literacy of reading, writing, and mathematical reasoning are insufficient for lifelong learning. The increasing amount of information from all sources and the pressure to remain in a constant state of conscious learning means that we must be dexterous in the use of information, too. The need to handle and use information is present in all stages of life and the acquisition of the competencies of information literacy must be intertwined with the acquisition of the other literacy [9].

Because becoming information literate is an active process, requiring the seeking out of knowledge from multiple sources rather than passively receiving and repeating back facts, the teacher's role must evolve from the giver of knowledge into being more of a coach or guide [10]. Teachers, professors, teaching assistants, librarians, administrators, and the community must collaborate to develop ways to involve the students into using not only in classroom materials but also resources from the broader community and the mass media. Some of our learning occurs in formal settings where what we learn is packaged and prepared for us. But much learning also occurs in non-formal settings, and, informally as well. Information literacy is crucial in all three types of learning situations.

Becoming information literate will involve a drastic change from the way many students are used to learning. First of all, it requires students to be more self-directive in their learning. This kind of independent, active learning prepares students for real-life problem solving [11], Also, in becoming information literate, students will assume more responsibility for their own learning either individually or in work groups. As students become more competent with their use of information resource options, they become aware of their individual styles of learning and preferred ways of assimilating knowledge [12].

In order to produce learners who are information literate, schools will need to integrate information literacy skills across the curriculum in all subject areas beginning in the earliest grades. Educational institutions that wish to produce lifelong learners should be engaged in some fairly basic rethinking of how teaching faculty and information specialists such as librarians and media specialists can work together toward this end [13]. For example, the principal, as instructional leader, fosters resource-based learning by providing adequate planning time and budget support. As instructional partners, the classroom teacher and library media specialist are actively involved in identifying the learning needs of the students, developing teaching units that facilitate activities which offer meaningful practice in using a variety of information resources, and guiding student progress [10].

The results of previous research studies [7, 8, and 9] discovered that college students need not only to possess an appropriate level of information literacy, but also to achieve that goal in several ways. One might be including social relations section to technology-related course such as technology in education or technology curricula informally. The purpose of this study is to investigate college students' knowledge of information literacy and how they identify it. In addition, we compared information literacy levels of students at different teacher education programs, elementary education and elementary science education.

II. METHODOLOGY

In order to accomplish goals of this study, a questionnaire "Pre-service Teachers' Information Literacy Questionnaire" adapted from Aldemir, was applied [14]. It consists of 35 Likert type statements and students were asked to rate their level of difficulty with the scale of very difficult (1), difficult (2), neutral (3), easy (4), very easy (5). They were asked to complete the questionnaire in 15 minutes and none of the students has difficulty to answer the questions in allowed time period. In addition to the questionnaire, personal information forms were used to collect data regarding participants' genders and academic background information. They were asked to indicate their high school types (Normal high school, Anatolian high school, Science high school, and Vocational high school) they graduated. The reliability and validity of the questionnaire were successfully completed by the creator and Aldemir [14] found a reliability of Cronbach's alpha 0.89 which is comparatively good.

144 participants studying at Erciyes University (ERU) located southeast part of Turkey were selected via stratified sampling method from a total population of 219 junior student (N = 144) enrolled in early childhood and elementary science teacher education programs. 79 of them (55 %) were female and the rest, 65, (45 %) were male students. All of them successfully completed elementary physics, chemistry, biology, pedagogical courses which enhance their information literacy understandings.

III. RESULTS AND FINDINGS

Data collection was followed by data analysis section to investigate our research questions. Next, we will illustrate results of the study and examine findings according to our research purposes.

Below table illustrates students' information literacy ability levels obtained from the participants.

TABLE I. Pre-service Teachers' Information Literacy averages and standard deviation scores.

It. Num.	Statements	μ	σ
1	When I need to design Homework/project by myself	3.13	1.10
2	Identifying HW/Research information	3.31	1.08
3	Exploring HW/Research projects explicitly	3.48	1.00
4	Obtaining how to and where to find required information	3.64	1.02
5	Identifying keywords when searching for information on the Net	3.59	0.99
6	Deciding what kinds of information sources are more suitable for research	3.28	0.92
7	Utilizing various types of information sources (Encyclopedia, journal, counseling, almanac)	4.06	0.94
8	Utilizing web resources (Electronic journals, encyclopedia, websites etc.)	3.96	1.14
9	Selecting and using indexes and electronic database needed for acquiring information	3.26	1.16
10	Using web browsers (Google, yahoo, Alta vista, arabul etc.)	4.25	0.91
11	Understanding and applying manipulated information on accessible electronic information systems (databases)	3.33	1.12
12	When searching on the net, I can manipulate date, language, and category	3.73	1.06
13	When searching on the net, I use restrictions between concepts (e.g. "and, or, not")	3.99	0.77
14	When searching for the information, if I fail then I use different searching methods	3.76	0.99
15	When using library catalogues	3.66	1.07
16	Understanding information at catalogues	3.69	0.94
17	Using other library sources	3.45	1.16
18	Evaluating usefulness and appropriateness of the information with both qualitatively and quantitatively	3.83	0.74
19	Evaluating information in terms of timeliness, reliability, validity, and objectivity	3.49	0.92
20	Evaluating web resources in terms of timeliness, reliability, validity, and objectivity	3.14	1.05
21	Determining main objectives of resources obtained	3.81	0.82
22	Identifying similarities and differences between information resources	3.98	0.68
23	Interpreting information gathered	3.90	0.84
24	Correlating prior knowledge and new information	3.97	0.79
25	Paraphrasing information obtained from the literature review in my own words	3.71	1.05
26	Utilizing various sources when working on my HW/projects	3.59	0.97
27	Organizing parts of HW (cover page, content, introduction, main part, references, appendix etc.)	3.81	0.95
28	Indicating citations on HW(citation, quotation, referencing)	3.57	1.02
29	Preparing reference information of different resources used on HW	3.59	1.15
30	Presenting HW/research orally	3.07	1.23
31	Presenting research findings on written format (HW, report, article etc.)	3.90	0.96
32	Meeting requirements (number of pages, due date) on presenting information	3.44	1.14
33	Employing appropriate programs (Word, Excel) on presenting information	3.64	1.14
34	Criticizing HW/projects (identifying strong and weak sides)	3.52	0.95
35	Reviewing HW/projects and examining information for future references	3.89	0.83
Average Scores		3.64	0.99

Above Table I illustrates the students' responses, from "very difficult" to "very easy" in the information literacy questionnaire with the lowest mean average μ = 3.07 (Presenting HW/research orally) and biggest μ = 4.25 (Using web browsers (Google, yahoo, AltaVista, arabul etc.)).

Participants indicating item number 10 (μ = 4.20) about web browsers and item 7 (μ = 4.06) in relation to web resources as most difficult tasks. In contrast, item 30 (μ = 3.07) on presenting HW/research orally and item 1 on designing HW/projects themselves (μ = 3.13) as easiest task in the questionnaire. About the most difficult item obtained, Argoni et al. [15] obtained same item (item 10) as the most difficult task which was a surprise. A possible explanation for that conclusion might be education faculty members now assigning enough projects which require review of literature and investigations on the Net.

Potential explanations for obtaining items 1 and 30 as the easiest items might be students at school of education tend to work independently on their assignments and because of course contents in the current teacher preparation programs they prepare several presentations during their

academic years. In a typical elementary science education and early childhood programs, students are offered to take methods of teaching courses that requires micro teachings and presentation of their projects. Especially, the elementary science teacher program offers 31 credit hours of method course out of total 153 credit hours required for graduation. Early childhood teacher prep program also needs 29 credit hours of method courses out of 156. These figures show that around 20% of total study time period, students deals with information (such as Searching, collecting, analyzing, presenting).

In general, the average score for whole students' information literacy questionnaire was obtained 3.64 out of 5.00 which is around 73 % average. That represents students not being forced with information that need for their HW and projects purposes. This result also proves that most of pre service teachers at ERU are well prepared in terms of acquiring, gathering, manipulating, and presenting information.

When compared genders, females showed slightly less effort when handling information literacy. In table 2, females own 0.04 point higher than average for all students on easiness with information literacy. Males, on the other hand, shows smaller average compared to whole participants. Similar findings were also found on previous researches [14, 16, and 17]. They investigated information literacy surveys with graduate students.

TABLE II. Comparison of genders on Information Literacy.

Gender	N	μ	σ
Male	65	3.58	0.92
Female	79	3.68	1.05

Additionally, the high school each student finished revealed that students joining college from vocational high school present higher averages which means that they don't have as hard time as they cope with information literacy. The findings of various high school graduates are illustrated below.

TABLE III. Students' Information Literacy Questionnaire from Different High Schools.

High School	N	μ	σ
Normal HS	79	3.61	1.11
Anatolian HS	35	3.65	0.98
Science HS	16	3.66	0.99
Vocational HS	14	3.77	1.21

IV. CONCLUSION

In conclusion, one of the main findings reached in this study was that the average of pre-service science and early childhood teachers showed high average of information literacy based on the statements answered. With an average score of 3.64 (out of 5), most of them are able to handle information with adequate knowledge of using and manipulating them.

When comparing gender, females showed higher average. That might be explained with females' practical thinking and are handier than males and have more kinesthetic intelligence. Since that, male students could be checked with the knowledge of information literacy prior to any course, which requires dealing with information literacy.

Participated pre service teachers demonstrated averages scores between 3.07 for presenting HW and papers (between neutral and easy) and 4.25 for searching on the web (between easy and very easy) which means that all of them are above 3.00 which represent "neutral". This problem can be resolved if more microteaching and presentations are required from them. On top of that, they should feel more comfortable with presenting any researches or HW and this can be achieved with spending more time on how to present any HW and project in front of the class.

Finally, according to the findings of this study, more courses should be offered that contains information literacy abilities. Students will be more successful handling it when they have more theoretical background and information management practice. If possible, information literacy courses should be embodied on teacher preparation programs.

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