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SCIENTIFIC LITERACY LEVELS AT UNDERGRADUATES COLLEGE OF EDUCATION AND THEIR RELATIONSHIP WITH THE MEDIA

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ABSTRACT
The purpose of this study was to investigate the level of scientific literacy among scientific departments at Najran University College of education, as well as their relationship with media usage. The Sample of the study consisted of (30%) of the study population which included all students at scientific department (Physics, chemistry, Math's) of the college of education chosen randomly. To achieve these objectives (yes/ no) test, multiple choice as well as one open ended question was employed. After being analyzed, results showed the level of scientific culture at the university students is low which will reflect negatively on the advancement and development of community scientifically and technically, and there is a relationship with the media usage which helps in publishing scientific literacy and its development. Result also found the use of students of new electronic media more than traditional. Therefore, we should focus on the new media to raise the level of scientific literacy in adults and those that make decision. Finally, the study recommended the necessity of reconsidering teachers preparing program at college of education, as well as the addition of scientific literacy course in their study, in addition to improving academic courses at scientific departments, while connecting them to society issues.
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KEYWORDS: Scientific Literacy, Education Students, New Media, Traditional Media, Najran University

INTRODUCTION
Scientific literacy is one of the basic concepts characterizing sciences and always mentioned in scientific education and in science methods and teaching literature (Zaytoon, 2010), as well as an ongoing and of scientific education, which sought to achieve for all students of this age (The National Research council (NRC), 1996), in order to realize societal awareness needed to deal with charges and trends, in a flexible way, oleander by this age and to enhance economic growth and leadership, as well as improving both social and environmental well – being (Zaytoon, 2010), so , scientific literacy forms the driving power of change and reform in scientific education and science teaching methods.

So, scientific literacy is a wide construct that includes scientific ideas and concepts with and across scientific various majors, as well as scientific practices, It was detained in research literature as the knowledge and understanding of scientific concepts and processes required for personal decision making, participation in civic and cultural affairs, and economic productivity" (National Academy of Science (NAS), 1996). While PISA in the frame of science assessments (2015) defines it as the ability to engage with science-related issues, and with the ideas of science, as a reflective citizen. And describe a scientifically literate person, therefore, is willing to engage in reasoned discourse about science and technology which requires the competencies to: Explain phenomena scientifically – recognize, Evaluate and design scientific inquiry, Interpret data and evidence scientifically (Organization for Economic Cooperation and Development (OECD), PISA, 2013).

Achieving scientific literacy for all students is one of the main objectives for teaching science, and a continues aim of scientific education in our age (NRC, 1996), that goes with students for their lives. So Many countries around the world adapted this direction in the form of rushing towards equipping their subjects with scientific literacy as the most powerful element of our world advancement. In the United States, for instance, the National research council (NRC) and American Association for the advancement of science (AAAS) published new standards and scales about scientific literacy concert, assessment and teaching methods (NRC, 1996; AAAs, 1993). These organization in association (AAAS) with National science teacher Association (NSTA) a common statement on February (1996) emphasizing the importance of scientific literacy stating that the priority in scientific literacy became a salient slogan adopted by many educational systems all over the world (Holbrook and Rannikmae, 2009).
At the same dime, several international programs took care in measuring the achievement of scientific literacy among various society classes, i.e. teachers

and learners, as a basic objective in learning, among which The program for international student Assessment (PISA) affiliated with the organization for economic cooperation and development (PISA, OECD, 2005) which focuses, mainly on retrieving knowledge from form instructional content. And trends in mathematics and science studies (TIMSS) program (National Center for Education Statistics (NCES), 2011) which tends to focus on practical knowledge as practiced at work, that is perceiving scientific questions, specifying related evidences, critical assessment of conclusions and communicating scientific ideas (Fensham&Harlen, 1999; Harlen, 2001; OECD/ PISA, 2005). Bybee (1997) and the Biological Science Curriculum Studies BSCS (1993) also suggested a comprehensive theoretical scale that is more suitable for the assessment of scientific literacy during science studies at school, since its hierarchy can be easily transferred to instructional purposes (Shwartz, Ben-zvi, &Hofstein, 2006; Holbrook and Rannikmae, 2009). Miller also developed Civic Scientific Literacy scale includes most of the issues raised in the 2016 project, which revolves around the fundamental concepts to form the universe (Miller, 2007).

The preparation of the scientifically literate citizen is complex, especially with multiple sources of scientific literacy in the era of information and communicationtechnology revolution and the media. Since the end of World War II, the world has seen progress in the television and computers, satellites and the transistor and fiber optics and wireless communications and the Internet. Citizens has become up to a lot of information inexpensively, and communicates with many individuals across vast distances quickly. Perhaps that technological advances have a negative impact on traditional media such as newspapers in print and newsmagazines according to the Pew Research Center (Pew Research Center, 1990). The recent National Endowment for the Arts report (2007) on reading points to a troubling decline in the ability of many young adults to read complex material (Miller, 2010). However, the scientific literacy promotes empowers students to: understand the basic concepts in the media and civic policy, improve inquiry and critical thinking skills, and make connections about our interaction with the natural world (Brewer, 2008).

LITERATURE REVIEW

Most previous studies showed fewer level of scientific literacy among individuals, most prominent of which Miller (1997) study that measured scientific literacy level in the united states of America and showed that only 7% of the Americans can be as scientifically literates, as well as Miller study (1983), which showed the low level of technical enlightenment of compulsory teaching students and American's Youth (25Years olds) and for these of 65 Years or older.

Also the study conducted by Arizona University at Tucson for a period of 20 Years and showed no improvement in university scientific literacy (Impey, Buxner, Antonellis, Johnson & King, 2011). And Bin-zvi&Hofstein (2006) study that assessed chemical literacy development among senior high school students, using Bybee scientific literacy taxonomy, and found that students improved their nominal and functional scientific literacy.

In addition to the Arab Studies and Saudi Arabia precisely; which indicates a low level of scientific literacy at the teachers and students' teachers in colleges of education (Zoubi, 2008; Al-Shahrani, 2000; salamah, 1996). These studies come Unlike Chin (2005) which indicated that first-year students in the teachers colleges in Taiwan have a convincing level of scientific literacy.

Several other studies addressed factors influencing scientific literacy, including Miller (2007) study that found that existence of a relationship between the media and the level of scientific literacy, particularly new media, , as well as other variables such as scientific courses completed, GPA level, and using electronic resources. And study of Pew research center (2006) that shows a pattern of mixed use, with most adults continuing to use a wide array of traditional media—primarily print and broadcast—while simultaneously beginning to increase their acquisition and use of new electronic communication technologies: computers, mobile phones and handheld email devices, wireless devices, and the Internet; however Impey et al. (2011) study found no specific factor affecting scientific literacy, while Al–Khtaibh and Ambo (2002) study has confirmed this result.

The mixed results of previous studies dousing a university, forced us reconsidering teachers preparing Programs in our universities, so as to make able to produce scientifically literate and critical teachers capable of solving science related problems (Bybee, 1995).

PROBLEM OF THE STUDY

Several research studies showed that prevailing scientific literacy do not work on preparing scientific literate persons (Zoubi, 2008), therefore several scientific education programs, to achieve scientific literacy among students, were developed, including 2061 project introduced by AAAS, projects for National scientific Education standards proposed by National Research council a branch of NESE, movement for science courses Reform in the light of the interaction between science, Technology and society (STS) and Scope sequence coordination

(SSC) Project in the united states of America (Ali, 2013).

However, several international studies found that scientific literacy level among teachers, students, and individuals was low in third world countries, (Jenkins, 1994; Prime, 1998; BouJaoude, 1998; Zaytoon, 2010). As teaching and Learning process depends mainly on teachers for the development of scientific literacy, it is necessary teachers are able prepare to achieve the objective of dissemination of scientific literacy and the development levels of the students by focusing on the adult category (graduates) for possessing the ability to acquire and understand new concepts faster than others and because they are our teachers in the future. And the adoption of the publication and the development of scientific literacy on the formal and informal learning, we focus on the media in it, and therefore we must find out the most commonly used means when this class to exploit the optimal way.

In Light of repeated calls for transmitting scientific literacy among students and the importance of this literacy, and given the paucity of research studies dressing students teachers category, to find the level of their scientific literacy in the Arab society in general and in Saudi Arabia in particular. Sothis study is to investigate the level of scientific literacy among scientific departments' students at education colleges and their ability to understand and analyze daily life phenomena's observations and situations, and the extent of the use of information and communication means traditional and electronic access to scientific information and its relationship to scientific literacy on the other. So, the present study sought answering the following research questions:

- What is the level of scientific literacy at college of education's students?
- What is the media most commonly used at university students?
- Is there any relationship between level of scientific literacy and the usage of media?

SIGNIFICANCE OF THE STUDY

Significance of the present study stems from the importance of the subject it addressed, which is the assessment of scientific literacy level among scientific departments' students at Education College and its relationship to the media on the other. So it is hoped that its results provide, researchers in this subject – as scientific literacy is one of the most important educational goals and which needs continuous study in light of continuous development and change around that world – about the level of scientific literacy in developing countries, compared with developed countries. And it might constitutes a feedback to those specialists concerned in curricula development at universities regarding the effectiveness of university Courses in developing scientific literacy in light of continuous development of scientific education and about the improvement of teaching strategies to be used, such as hybrid learning activation based on media favorite among students to acquire knowledge. Finally this research might contribute in directing those responsible of teachers Pre service preparing programs, views, regarding the level of their student's scientific literacy at the end of their preparation period, which might help in the development of current programs and designing programs that go hand by hand with globalization and technological age.

LIMITATIONS OF THE STUDY

- The study was conducted on a single university in the kingdom.
- The study was conducted during 2015 / 2016 academic year.

METHODOLOGY AND PROCEDURES

Population and Sample

The study population consisted of scientific department students (physics, chemistry and Mathematics) at Najran University totaling for 151 students, while research sample consisted of (30%) of them, totaling for 46 randomly selected students.

Methodology and Instruments

The study employed descriptive survey method based on studying the phenomenon sits is for a large sample size, to shedding light on scientific Literacy among university students in Saudi Arabia and its relationship to the media, for this objective, a questionnaire of two parts, one is cognitive test of yes / No type, multiple choice and one open ended question that focus on a set of scientific literacy standards, vise a vise, basic scientific structure concepts, understanding science processes and its inquiry nature, and Level of science and technology influence on both individuals and society. However some of its items interfered, with NSF questionnaire indications, which was administered by Miller for many years, and which were consistent with scientific knowledge studied by students at Saudi universalities, where Miller's scale enjoyed with the advantages that most of submitted issues were the focus of 2016 project and revolved around core concepts of the universe formation, The other is a survey on the use of traditional and new media, and he distributed that questionnaire on paper to the students in their classes and was collected at the same time.

Data were interred into the computer, but coded manually by the researcher, after assuring its content validity by submitting it to a panel of referees from educational experts in science and mathematics and their teaching methods from Najran University as well as Measurement and evaluation experts. Its reliability was assured by administering it on pilot

sample of (50) students from the study population but not from the study sample, internal consistency coefficient (α - Cronbach) were computed and were (78).

Statistical Analysis

Researcher entered data to the computer for a period of four months (one study semester) during 2016, uncompleted and residual data which were excluded from the analysis were 10% of the total questionnaires. Cognitive test in its both parts (Objective and open ended) was scored. After that descriptive analysis of each of the knowledge questions started, variable by variables, summing total scores for each question and total test score for each student, computing Means, standard deviations, T-test to determine the level of scientific culture in general. Percentages for the use of different media (traditional / electronic) and regression coefficient is also calculatedto investigate the impact of the media on scientific literacy from the other hand.

RESULTS AND DISCUSSION

Results related to the first research question: What is the level of scientific literacy at College of Education's students'? Means and standard deviations for students' answers on the scientific literacy test were calculated. T. test was also used for one sample. Table 1. shows results summary.

Table 1. Means, standard deviations, T-test for the difference between the means of graduates' responses

Items	N	Least degree	Highest degree	Mean	Mean %	Std.	Std. error	T. Value	Sig.
Scientific literacy	46	5	14	10.33	61%	2.88	0.43	-8.64	0.00
Accepted educationally (80%)*	46	-	-	14	-	-			

*Mastery criteria as determined by many studies, (Millman, 1979)

Table 1. above shows that the extent of the scientific literacy among Najran University graduates ranged (5 - 14) out of the total degree (17) on the scientific literacy test. It was in fact a low level in comparison with the educationally accepted one (14 out of 17 or 80%). And the value of T-test calculated (-8.64) level of significance (0.00); they are less than the significance level used in the research (0.05). This indicates that there was a statistically significant difference and the student did not get it to an acceptable level. This difference might refer to the teaching programs and courses that do not focus on the scientific aspects of the nature of science and how it can be employed in the first place. In the second place it might be because of the use of scientific laboratories as places of knowledge consumption as well as confirmatory. In the third place it might be because of the focus of scientific departments on teaching the theoretical cognitive sides and inevitable issues significantly without taking into consideration the embedding of the science concepts within university plans and adopting teaching strategies that enhance contextual understanding of the of science. Such a result is, on one hand in agreement with Miller study (2007) which pointed to the low level of scientific literacy at the university students. It, on the other hand disagrees with chin (2005) and Impey et al. (2011) study**.**

Results related to the second research question: What is the media most commonly used at university students? To answer this question the percentage of the media usage was calculated. Table 2. illustrates this

Table 2. Degrees of usage of various media

	Traditional Media	New Media
Watches network/cable TV news 3+ days/week	78%	
Read 1+ science/health books in last year	67%	
Watches 1+ science television show/month	57%	
Reads a print newspaper more than once/week	39%	
Reads a science or health magazine regularly	35%	
Reads a newsmagazine regularly	20%	
Has computer access at home or work		96%
Searched for health information on Web last		85%
Looked for current news on the Web last year		80%
Has high-speed home computer connection		74%
Printed material from the Web at home or work		65%
Looked for science information on the Web		63%
Looked for info (map, weather) on Web last year		54%
Reads an online newspaper more than once/week		36%
Looks at online news report 3+ days/week		30%

Table 2 shows that, seventy-eight of students reported that they watched a network television newscast three or more days each week. Sixty-seven percent indicated that read one or more science or health books in the preceding year. Fifty-seven percent claimed to have watches one or more science television show each month. Approximately a forty claimed to read a print newspaper at least once a week. Thirty-five percent indicated that they read a science or health magazine regularly, and only twenty percent of students reported that they read a newsmagazine regularly, although only 11 percent of adults reported that they read a newsmagazine regularly.

At the same time, nearly 96 percent of students reported that they have access to a computer at home or at work, 85 percent of students that they have searched for health information on the Web during the preceding year, eighty said that they looked for current news information on the Web during the preceding year, 74 percent of students reported that they have a high-speed link from their home computer to the Internet, 65 percent indicated that they have printed information from the Internet at home or at work, 63 indicated that they sometimes look on the Web for science information. and 54 percent said that they looked for specific kinds of non-news information—maps, directions, and weather—on the Web during the preceding year, and approximately a thirty of students reported that they read an online newspaper at least once each week and seek news information from a website three or more days each week.

We shows that a pattern of mixed use of traditional media (print and broadcast) while simultaneously beginning to increase their acquisition and use of new electronic communication technologies: computers, mobile phones and handheld email devices, wireless devices, and the Internet (Miller, 2010; Pew, 2006). This may be explained by The growth of high-speed links to the Internet, access to better-quality home printers, and an expanding array of useful Web resources have fueled a major transformation in the ways that students get information. Most majority of students has at least one foot in the electronic media pool, and they are beginning to rely on the Internet for current news, weather, and health information. And this is demonstrating that the Internet is becoming a reference resource for a wide array of purposes. This result is seen in agreement with Miller (2010) and Pew Research Center (2006) concluded.

Results related to the third research question: Is there any relationship between level of scientific literacy and the usage of media? Pearson Coefficient correlation was calculated and results are presented in table 3. below.

Table 3. Pearson coefficient correlation of scientific literacy

The media		
Scientific literacy	Pearson	0.323
	Significance	0.028
	Participants	46

** The level of statistical significance (α= 0.05)*

Table 3. before reveals that Pearson correlation coefficient is statistically significant. That is mean, there is a relationship between the scientific literacy level and their usage of media. Such a finding can be explained by continuing students need to access to scientific knowledge to understand. And may be due to the widespread use of modern media and communication like Facebook and Twitter and other, in addition to the ease of subscription and browsed and transfer of local and international news, as well as it is inexpensive. This refers to the educational impact of the media as well as the impact of the scientific literacy on them. . This finding is in agreement with Miller (2010) and Brewer (2008) study.

CONCLUSION

This study aimed to investigate the level of scientific literacy among students in academic departments in the College of Education at the University of Najran and its relationship with the media. The following conclusions were reached:

1. In general, level of scientific culture at the university students is low. Therefore it is necessary to increase ratio of adult scientifically literate in our society by learning the formal and non-formal science to keep the community appreciates of science and values and democracy.
2. The use of students of new electronic media more than traditional. Therefore, we must introduce the basic concepts of modern science in the official books and university courses and electronic media at students category, because they have mental constructs help to understand new concepts and replace the misconceptions they have faster than others.
3. Education is the foundation for media use. Thus, building a strong knowledge base in science and reading requirement for the development of scientific literacy by using media and communication advanced.
4. There is a relationship between the media usage and scientific literacy, particularly electronic communication media. So we focus on the popular media in the dissemination of new scientific knowledge.

RECOMMENDATIONS AND SUGGESTIONS

1. Improving university courses curriculum in scientific departments at Education College as to focus on functional knowledge side concerning

individuals, society, life issues and problem solving.
2. Reconsidering teachers preparing program to provide them with appropriate scientific literacy, and the development of reading skills for knowledge and research.
3. Using suitable teaching strategic that enhances scientific inquiring, experimenting and ability in decision making.
4. Adding scientific literacy courses and nature of science to graduate students.
5. Conducting similar studies with larger and more representative samples.

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