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Information Literacy Skills: Promoting University Access and Success in the United Arab Emirates

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Abstract

The focus of this research is to assess the level of information literacy (IL) skills required for the transition-to-university experience across the United Arab Emirates (UAE). This research further seeks to shed light on the IL levels of incoming first-year university students and describe their perceptions of their IL skills. The research population consisted of first-year students from three private universities in the UAE: G1 from Ajman University of Science and Technology (AUST), G2 from Al Ain University of Science and Technology (AAU), and G3 from Al Hosn University (AHU). The three groups were recruited from students enrolled in first year general education classes. A total of 90 students were asked to take an IL pre-test to assess the level of IL skills they possessed upon entering university. Because the authors are currently teaching at AAU, G2 was trained as part of their first-year research skills course at AAU, while the other two groups G1 and G3 did not receive IL training. At the end of the semester, the authors used post-testing to determine if IL training helped improve IL skills of the trained participants. The post-test was given to two groups, including G1, which did not receive any training, and G2, the only trained group. Pre-test results identified a gap between the expectations and existing skills vital for secondary and university-level education in all three groups. The post-test evaluation of skills showed statistically significant increases in all IL assessed competencies. The need for customized curriculum to address the IL deficits revealed by new students is evident.

Keywords: information literacy, information literacy instruction, higher education, evidence-based practice, secondary education, United Arab Emirates

1. Introduction

Over the past decade, students have been adjusting to the rapid introduction of new information and media technologies. To accommodate this proliferation of new technologies, 21st-century students need IL skills that enable them to obtain the knowledge that qualifies them to be information literate. While IL is "increasingly considered as crucially important to enable people to deal with the challenge of making good use of information and communication technology" (UNESCO, 2008 in Horton, 2008: 3), generally this is prioritized in developing countries.

As a result, students who are growing up in a global digital age, particularly in developing countries**,** are not guaranteed to turn into skilled information hunters and users.

Researchers have confirmed that higher education delivers the most information-rich experience in a student's life. "Within today's information society, the most important learning outcome for all students is being able to function as independent lifelong learners. The essential enabler to reaching that goal is information literacy." (Britvic, 2000: 1) Even so, some researchers like Bailey, Hughes, and Karp (2003) indicated that more students enter the world of higher education unprepared for the IL skill requirements of a university-level curriculum (Foster, 2006).

Moreover, to keep pace with the changing economy, schools need to offer more rigorous requirements mandating that students use IL skills to solve problems, collaborate, and create. Murray (2008) recognized this fact by acknowledging that, "21st century students must be able to purposefully access information

from a variety of sources, analyze and evaluate information and then integrate it to construct a personal knowledge base from which to make intelligent decisions" (p. 36). Therefore, the ever-developing information environment demands that IL curriculums be present in secondary and higher education.

Various scholars define IL as a group of capabilities that a person can make use of "to cope with and to take advantage of the unprecedented amount of information which surround us in our daily life and work" (Candy, 1993: 284); and point out that such capabilities facilitate participation in lifelong learning experiences. Marais (1992) also defined IL as "the process of acquiring knowledge of attitudes and information skills, as a major determinant of the way in which people exploit reality, develop, live, work, and communicate in an information society" (p. 75).

Although numerous studies have been done to integrate IL into classrooms in different parts of the world, evidence suggests that little research exists on this topic in the Arab region. On the other hand, there is a growing awareness in the UAE in general, and in AAU in particular, that IL has become one of the most important skills in the information era and that universities and secondary schools have a specific responsibility to prepare students for the challenges created by the current information age. Therefore, if an IL curriculum is established for AAU students, they will be able to incorporate these resources into their coursework and later in the workplace, and be adequately prepared for the problems and critical thinking tasks they will face in everyday life.

To assist in integrating IL skills into teaching and learning practices at UAE private universities, this research intends to provide the foundation for an IL skills course. This course can be integrated into the curriculum, and used to meet general education or university requirements.

1.1 Research Questions

The following research questions are addressed:

A. Is there a significant difference in IL mean achievement scores of the students in G1, G2 and G3 in the pre-test?

B. Is there a significant difference in IL pre-test and post-test mean scores of G1, G2 and G3?

C. Is there any significant difference observed between pre-test and post-test scores of G2?

D. What are the areas of weakness in IL skills identified by students?

1.2 Objectives of the Study

This study seeks to explore students' IL entry skills into the university environment in the UAE. More specifically, the purpose of this study is to evaluate the IL skills of incoming students at Al Ain University of Science and Technology (AAU), Ajman University of Science and Technology (AUST) and Alhosn University (AHU).

The findings of the study will provide local institutions with reliable data regarding students' levels of mastery in the IL field compared to the IL skills required to succeed in the UAE's university programs. This data also supports advocates for information literacy education as a mechanism for educational change. Patricia Breivik (1998) promoted this integration of IL skills into university general requirements curriculums to accommodate new students. Breivik confirmed that "the best place to start information literacy planning is with general education or core curriculum, where concerns for competencies that all students should acquire provide a natural home for the discussion of information literacy abilities" (p. 44). The data also suggests the need for secondary school IL curriculum to provide all students with the preparation they need to succeed in universities.

1.3 Purpose of the Study

To significantly increase the number of students successfully completing university and achieving degrees and credentials that brings value to the labor market by:

A. Identifying the competency level of IL skills among first-year undergraduate students.

B. Identifying areas of strengths and weaknesses in IL skills among the students.

C. Exploring students' perceptions of IL instruction offered to help them achieve basic IL levels.

2. Literature Review

Academic institutions worldwide, including in the Middle East, have adopted e-learning and thus implemented learning management systems (Lasrado, 2009). This fact is especially true for Gulf

Cooperation Council (GCC) countries. GCC countries are facing the challenge of creating sustainable modernization plans in the education sector (Robinson and Ally, 2009). Moreover, tracking the impact of the emerging global information and computer technology in developing countries, UNESCO (2007) reinforced that higher education in the Arab states is presently undergoing rapid reforms. The UAE is one of the Arab countries that have already made a good start in e-learning. Confirming this, Guessoum (2006) stated that "with its state-of-the-art digital infrastructure, the UAE has set the stage for rapid advances in e-learning while others remain at the concept stage."

In spite of enthusiasm for e-learning effectiveness, online learners remain reluctant to learn and limited in skill. The individuals most likely to benefit from e-learning are those with high information and communication technology (ICT) skills, while people with lower levels of ICT expertise have a decreased chance of being efficient e-learners. Therefore, there is a clear need for preparatory training and ICT skill upgrading to prepare the low-skilled students for the e-learning environment (Kember et al., 2001).

This reaffirms the importance of IL as a pre-/co-requisite for the e-learning environment. Therefore, it is highly recommended to incorporate a "generic skills model" into first-year students' knowledge base to bridge the gap between their "existing skills" and "required skills." As a result, this will help students acquire a university-level study approach during the first year of their study program. This will also help enhance their readiness for online learning and "meet [the] challenges and adopt positive learning skills that [shape] their entire learning experience." (Nelson et al., 2005, p. 3)

3. Method

3.1 Data Collection

This study was carried out at AAU in the academic year of 2012-13, however surveys were also distributed at AUST and AHU. Since some students take classes at more than one university**,** those students enrolled in elective courses at AAU were recruited to distribute the survey at AUST and AHU.

AAU supports the point of view adopted by the Boyer Commission on Educating Undergraduates in the Research University that a first-year experience should provide stimulation for "intellectual growth and a firm grounding in inquiry-based learning." (Baily, 2001: 12) IL fits well with this educational goal. Without a certain level of essential IL skills, students will find it difficult to cope in a university-level environment.

Prior to this study, it was clear that insufficient UAE-based research on this transition period to university was available, especially in terms of its possible impact on learning achievement. To fill this gap, this current study is meant to build on and further reinforce the results of a preliminary study (Shana and Dabbagh, 2012). This previous study confirmed that students are not taught IL skills in secondary schools and that they have modest knowledge of IL skills that universities require. In order to yield results that can be more confidently generalized from the small sample to the larger and more diverse population, this follow-up study was conducted.

The inputs of the study included: 1) a survey, 2) a reflective journal, 3) three-point Likert Scale questionnaires; and 4) a final assignment/project in which students performed a short practical research task and demonstrated the steps involved.

A survey instrument was designed that measured students' self-assessments in relation to a range of IL skills. At the beginning of the semester, pre-test data assessing IL skills was collected from the three groups (G1, G2 and G3).

Testing was re-administered at the end of the semester after students in G2 had learned, practiced and applied IL in class, and had completed a mini-research assignment and an in-class presentation. Participants were also asked to write a reflective journal about this IL experience and to identify their areas of strength and weakness with IL skills. In addition, participants also self reported their IL confidence levels by using a three-point scale to respond to statements. All of these tools required students to use a wide range of methods for gathering, analyzing, storing and using information from a variety of sources in an efficient manner.

3.1.1 Research-Based Training

Research indicates that technology can support more student-centered approaches to instruction and help develop higher-order skills as well as encourage involvement in the teaching process and collaborative learning (Haddad, 2003).

Students taking required undergraduate general education courses at AAU are generally in their first or

second year of university because these courses are a prerequisite for many upper-level courses. While general education requirements for all students are selected from the same list of approved courses, students independently choose which of the general education courses to take.

Currently, AAU offers a "research skills" course as part of its general education course offering. Accordingly, the researcher/instructor used "inquiry/research-based learning" by assigning a research problem and providing all the technology and tools students needed to solve it. To solve this problem, participants needed to gather information from different resources, evaluate it, and ethically use and present it.

The role of the trainer was strictly to monitor the students' progress toward achieving their goals, to mentor them, scaffold them, and always be ready to demonstrate, illustrate and discuss students' concerns. Scaffolding instruction is defined as the "role of teachers and others in supporting the learner's development and providing support structures to get to that next stage or level." (Raymond, 2000, p. 176) This can be achieved through the recommended six aspects of scaffolding instruction (McKenzie, 1999):

A. Clear direction and reduction of students' confusion.

B. Clarification of purpose and expected outcomes.

C. Continuously checking students' projects/assignments.

D. Clarification of students' confusion and frustration.

E. Correct mistakes to eliminate difficulties and maximize learning.

For the inquiry/research-based processes, IL skills are arranged under the essential steps of the research cycle:

A. Questioning: Generate a research topic.

B. Planning: Develop a search strategy for a literature review.

C. Gathering: Collect the relevant information from print and digital sources.

D. Sorting and Sifting:

1) Quoting and paraphrasing.

2) Documenting.

3) Labeling the information (fact vs. opinion; primary vs. secondary sources).

4) Evaluating in accordance with authority, currency, and reliability of information.

5) Synthesizing: Creating an original product that meets the criteria of a successful project.

6) Applying a fundamental understanding: Defining the ethical and legal issues surrounding information.

7) Communicating: Presenting information.

8) Evaluating: Judging the product and process and then reflecting.

3.2 Instrumentation

The evaluation strategy used in this study consisted of three instruments: An IL survey, three-point Likert Scale questionnaire, and student journals.

3.2.1 Survey

Surveying the entry-level IL skills of secondary school graduate students was the first step toward understanding the prior IL knowledge of first-year students at universities in the UAE. Thus, a survey was developed by the researcher and pilot tested by a group of professionals. Revisions to the instrument were made, based on the pilot test results, followed by a distribution of pre-tests to 30 students (G2) at AAU, who were enrolled in a level-one research skill course, which is one of the general requirement courses at the university. An additional 30 participants were randomly selected first-year students (G2) at AUST, and another 30 [also randomly selected?] participants were first-year students (G3) at AHU. The survey was administered at the beginning of the first semester of the academic year.

The survey was based on ACRL Information Literacy Competency Standards for Higher Education. The survey aims to help universities (AAU, AUST & AHU) document the level of IL skills of first-year students and to pinpoint areas for improvement.

The survey is a performance-based assessment that seeks to measure the quality of a students' performance

using a scoring guide. A five-point survey, with possible responses ranging from "poor performance" to "excellent performance", was designed to focus on performance that typically addressed main competencies in IL course outcomes. Based on IL standards, 10 items were identified as indicators of learning outcomes. Each item was given a weighted score ranging from 0 to 4 points (See Appendix A).

The student's final grade was based on a total summation of the survey score expressed as a percentage of the total possible score. Total points were converted first to a numerical value based on a 0–100 scale with higher scores representing better performance and greater achievement. As illustrated below, an equivalent letter grade was assigned to the percentage of the final survey score, "A" being the highest, and "F" denoting failure:

A. A score of 4 denotes excellent (A) and is worth 90-100% of the points available.

B. A score of 3 denotes very good (B) and is worth 80-89% of the points available.

C. A score of 2 denotes good (C) and is worth 70-79% of the points available.

D. A score of 1 denotes average (D) and is worth 60-69% of the points available.

E. A score of 0 denotes poor (F) and is worth 0%-59% of the points available.

3.2.2 Three-Point Likert Scale

To obtain student perceptions of the IL experience, students from G2 were asked to respond to a questionnaire twice, once at pre-training and again at post-training.

The second round of the questionnaire was distributed at the last meeting of the final IL training session. A total of 60 completed questionnaires were received.

Table 1. The percentage of student responses to the Three-Point Likert Scale statements

Agreement with statements about how the IL activities supported learning						
Test Items	G2 Pre-training (n=30)			G2 Post-training (n=38)		
	Agree	Disagree	Not Sure	Agree	Disagree	Not Sure
1	12	8	10	23	1	6
2	15	6	9	24	-	6
3	13	8	9	23	-	7
4	15	7	8	23	2	5
5	12	8	10	24	1	5
6	15	6	9	27	-	3
7	13	6	11	25	2	3
8	15	4	11	27	-	3
9	13	9	8	25	-	5
10	15	4	11	28	-	2
Total	138	66	96	249	6	45
Percentage	46%	22%	32%	83%	2%	15%

The results of the Likert Scale questions are summarized as shown in Table 1.

To elaborate on the students' responses, the researcher encouraged participants to express their feelings through a reflective personal journal.

3.2.3 Student Reflective Journals

Student journals were intended to provide valuable insight into students' perceptions and attitudes toward achieving the learning objectives of the IL training session(s), in addition to identifying the students' areas of weakness in IL skills. Data was obtained from students' journals, and reports were collected and

analyzed. The IL areas of strength and weakness were identified and summed up, and the percentage of positive/negative comments regarding the usage of IL as a learning tool was calculated (82% positive comments vs. 18% negative comments).

Positive comments given include:

A. "IL skills will allow us to quickly assess a new piece of information to see if it is accurate or to learn if the sources are reliable."

B. "Finally I learned how to do an American Psychological Association (APA) formatted term paper with footnotes, a title page, and a bibliography."

C. "I can now inquire from many viewpoints. My analysis and inquiry skills are much better."

D. "IL strengthened my judgment abilities and encouraged flexible thinking and analysis."

E. "The learning and process of the IL skills training session helped me to be a lifelong learner."

Major areas of difficulty included:

A. Defining problems and focusing a topic to something manageable.

B. Finding the key concepts in given material.

C. Developing search strategies and defining where to go for information.

D. Selecting relevant sites to search questions.

E. Finding material in the library and evaluating the search results critically.

F. Preparing the bibliography and using the collected information in a meaningful context.

G. Consulting a variety of sources as Google was the most essential source a participant consulted in order to be familiar with a subject.

Based on these findings, suggestions were proposed to help develop IL transition pathways/programs and integrate them in secondary school and university curriculums.

4. Findings and Discussion

This study examines the impact of IL instruction on student learning and attitudes. Statistical analysis was performed in order to answer the research questions below with statistical objectivity.

A. Is there a significant difference in IL mean achievement scores between students in G1, G2 and G3 in the pre-test?

B. Is there a significant difference in IL mean achievement scores between students in G1, G2 and G2 in the post-test?

C. Is there a significant difference in IL pre-test and post-test mean scores of G2?

As a starting point, it was very important to assess whether the means of the three groups (G1, G2 and G2) were statistically different from each other in the pre-test scores. Using One-way ANOVA, results were statistically equivalent. Therefore, there were no significant differences at the starting point of the study (Table 2.)

Table 2. Pre-test scores for G1, G2 and G3

Group	N	Mean	StDev	Pooled StDev
G1	30	69.967	13.187	7.920
G2	30	72.383	1.981	
G3	30	71.757	3.217	

As shown in Table 2, the decision is to *accept* the null hypothesis, because (0.75) falls out the critical value of F distribution (3.07).

To determine whether there was an improvement in student achievement due to the IL training, a One-way ANOVA statistical analysis was performed to determine whether there was a statistically significant difference between the pre-test and post-test scores for students in G2, the trained group.

Table 3. Pre-test vs. post-test scores for the trained group, G2

G2 Level	N	Mean	StDev	Pooled StDev
Pre-test	28	2.7607	0.3838	0.4437
Post-test	29	3.7159	0.4946	

As shown in Table 3, the decision is to *reject* the null hypothesis, because (66.03) falls in the critical value of F distribution (4.00).

In addition, it was important to compare the achievement progress of all groups to validate the efficacy of the treatment by verifying if there was a significant difference between G1, G2 and G3 in the post-test. A One-way ANOVA was conducted to show the difference between the mean post-test scores for the groups. This analysis shows that the overall mean post-test scores for the groups are significantly different (Table 4).

Table 4. Post-test scores for G1, G2 and G3

Group	N	Mean	StDev	Pooled StDev
G1	28	2.7607	0.3838	0.4705
G2	29	3.6814	0.5531	
G3	29	2.6872	0.4563	

As shown in Table 4, the decision is to *reject* the null hypothesis, because (40.02) falls in the critical value of F distribution (3.07).

The ten items of the three-point Likert Scale and the student journal data were intended to gather supporting information and evidence to answer the research questions. The data confirms that students regard IL skills as a precious and valuable learning tool and as a result, they gave positive comments regarding their IL experience.

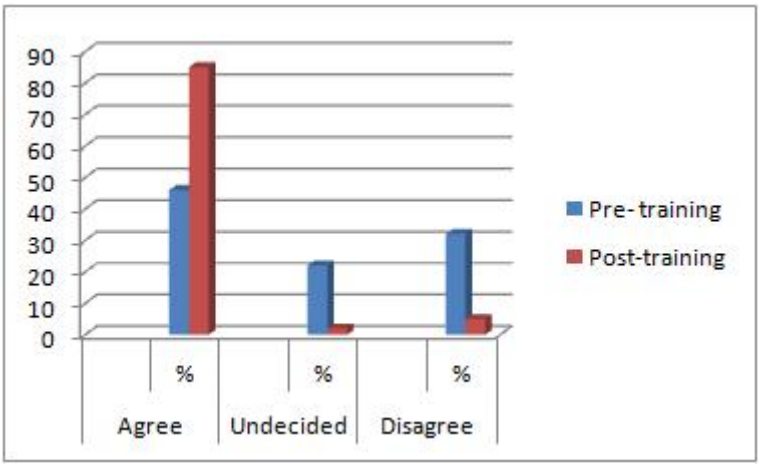

Figure 1. Agreement with statements about how IL activities supported learning

As illustrated in Figure 1, positive comments from the Likert Scale and from student journals increased (from 46% at pre-training, to 83% at post-training) with IL exposure and experience.

These comments will be considered as clues that will be taken into consideration when creating an evaluation criteria framework to design IL courses and as a basis for future online tutorials.

5. Conclusion

The core objective of this study was to assess the level of IL skills of students transitioning from secondary school to university. Furthermore, this study sought to demonstrate the impact of IL instruction on student learning and IL skill attitudes. Accordingly, the following data was concluded:

A. The results of this study indicated that secondary school graduates entering three different universities across the UAE shared the same level of IL competency and there were no significant differences in their means.

B. The results of the post-test emphasized the importance of Information Literacy Instruction (ILI). Groups that received ILI showed a statistical difference in the mean score of the post-test and more positive attitudes toward IL skills as an augmentation for learning.

C. The significant difference between the mean scores of the pre-rest and post-test showed the value of the intervention/training that G2 received, which led to a positive outcome on the post-test and on attitudes regarding ILI.

D. The result of intervention/training assures that we can help our freshmen become more competent and successful with IL skills.

E. Although some students may start an IL course doubting that they need it (Gross & Latham, 2007), data from this research provides an empirical indication that students who use IL skills as a learning tool will acknowledge learning as something useful by the end.

F. Students transitioning from secondary school to university experience a remarkable shift from undertaking highly structured tasks with assistance to self-managed learning. Therefore, the positive comments regarding ILI and the mentioned areas of weakness in IL skills can serve as the fundamentals of an ILI transition program.

G. In general, the results of this paper provide evidence that supports that secondary school students do not have the necessary IL skills needed to transition to a university learning environment and that something should be done about it.

6. Recommendations and Implications for Implementation

In today's information-rich world, ILI is becoming a priority in academic programs (Boekhorst, 2004) across the majority of universities in the UAE. On the other hand, IL research is still in its infancy according to Bruce (2000b). Due to this fact, the current data clearly indicates that additional consideration must be given to IL skills because today's UAE university students still need support with developing and strengthening these important skills.

In order to provide academic competency and achievement in an era characterized by constant change, 21st century students need to acquire, enhance and practice new IL knowledge and skills especially during the transition period.

A. During the transition period, universities need to pay increased attention to the development of their first-year students' IL skills and better prepare them for success in the labor market.

   1) Lack of understanding of prior IL skills knowledge is in itself an obstacle to engaging in the meaningful learning and research process in the student's first year.

   2) This lack of understanding may result in programs that do not inspire students or explore their potential and encourage their capacity for innovation.

B. Secondary school students preparing to enter university are lacking the IL skills needed to optimize this level of education, and needed to achieve success in the job market, which requires a range of skills to function effectively in an information-rich society.

   1) Secondary school graduates have low competence in IL skills. Consequently, it is highly recommended that secondary schools should integrate IL programs in their school curriculum.

   2) Secondary school graduates need IL transition programs at both the secondary level and university level in order to acquire skills that meet current market needs in this era of digital information explosion.

3) Educators are entering a new reality where students need new IL skills that address the questions and problems emerging from the information explosion, and to help translate information into knowledge in their disciplines.

C. IL transition programs in secondary schools and universities can take a variety of forms: independent courses, extracurricular courses, web-based tutorials, or course-integrated instruction, in addition to IL skills demonstrations and workshops, training sessions, lectures and regular library visits and tours.

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Appendix

A. IL Performance-Based Survey

IL Skills	***Level of Competence***					***POINTS***
Ability to:	*Poor 0*	*Satisfactory 1*	*Good 2*	*V. Good 3*	*Excellent 4*	
Define and refinine a research topic.						*/4*
Create the information needed for a research question.						*/4*
Find and retrieve appropriate information.						*/4*
Use a variety of tools for accessing information.						*/4*
Use web browsers and the Internet, the library web site, the library catalogue, and databases.						*/4*
Evaluate information.						*/4*
Synthesize and organize information.						*/4*
Legally obtain, store, and use text and data.						*/4*
Present and communicate information.						*/4*
Cite sources properly according to appropriate style guide.						*/4*
					Total	*/40*
					Average	
					Grade	

Performance-based survey that seeks to measure the quality of a students' performance using a scoring guide.

B. The Three-Point Likert Scale

My experience with IL:		***Agree***	***Disagree***	***Not Sure***
1	I was satisfied with the overall experience using IL skills.			
2	I enjoyed the part of the course on IL skills.			
3	The IL skills part stimulated my desire to learn.			
4	I was satisfied with IL skills in regard to the quantity of my learning experience.			

5	I was satisfied with IL skills in regard to the quality of my learning experience.			
6	The IL skills motivated me to complete assignments.			
7	The IL new skills contributed to enhancing self-confidence.			
8	The IL skills enhanced my skills such as multimedia, communication and problem solving.			
9	The IL skills helped me understand and respect copyright law and university policy.			
10	The IL skills increased awareness of my ability and helped me better grasp concepts.			

The questionnaire consisted of 10 Likert Scale items, and the options for answering each question were: (1) Agree, (2) Disagree, and (3) Not Sure.