

Scientific and Civic Cultural Literacy Level of the Students of the American University of Madaba and its Relationship to Personal Variables

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Abstract:

The purpose of this study was to investigate the level of scientific and civic cultural literacy of the American University of Madaba (AUM) students and its relationship to personal variables. The sample of the study consisted of 437 students registered for the first semester of the academic year 2019-2020 at AUM and sat for a scientific and civic test, the main research tool. The analysis of data collected showed that AUM students are culturally literate in the science field where the scores are at a high level. However, it was a little less in civics as it scored medium up to a high level. Further, there were statistically significant differences at ($\alpha = 0.05$) in the scientific field in favor of the females, the international curriculum and health sciences faculty but not in the civics field. It is recommended that further research studies should be conducted on other fields of cultural literacy.

Key Words: Civic Cultural Literacy Level, Scientific Cultural Literacy Level.

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مستوى التنور الثقافي والعلمي والمدني لدى طلبة الجامعة الامريكية في مادبا وعلاقتها ببعض المتغيرات الشخصية

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ملخص:

هدفت هذه الدراسة الى معرفة مستوى التنور الثقافي والعلمي والمدني لدى طلبة الجامعة الامريكية في مادبا وعلاقته ببعض المتغيرات الشخصية. بلغ حجم العينة 437 طالبا وطالبة مسجلين في الفصل الاول للعام الدراسي 2019-2020 والذين أدوا اختبار الثقافة العلمي والمدني وهو اداة الدراسة الرئيس. اظهرت النتائج ان مستوى التنور الثقافي العلمي عال ومستوى التنور الثقافي المدني متوسط الى حد ما مرتفع لدى طلبة الجامعة الامريكية في مادبا. فضلاً عن ذلك، كانت هناك فروق ذات دلالة احصائية عند ($\alpha = 0.05$) في مستوى التنور الثقافي تعزى للجنس، ومنهاج المدرسة الثانوية ونوع الكلية وكانت لصالح الاناث، المنهاج الدولي وكلية العلوم الصحية على التوالي. وفي ضوء نتائج الدراسة، يوصي الباحثان باجراء مزيد من الدراسات لتشمل مجالات أخرى للتنور الثقافي.

الكلمات المفتاحية: التنور الثقافي العلمي، التنور الثقافي المدني.

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Introduction

Theoretical Background and Review of Related Literature

The whole world lives in a time of accelerated changes in all aspects of life: political, scientific, technological, social, cultural and global compasses. Cultural literacy is at the center of these changes that is simultaneously challenged to meet the needs of human's broader-based knowledge for better communications. Building blocks of knowledge and relationships among individuals from different cultural backgrounds demand joint activity toward mutual aims and cultural dialogues. This component, cultural literacy, becomes more important when one knows its benefits, particularly when exposing students to it may promote a world of understanding and tolerance.

According to Sobirin & Susapti (2018), literacy is the starting gate to open all knowledge through various study fields. In addition, the earlier one starts at home and school, the faster cultural literacy is gained. They added that developing literacy skills in general which are a mixture of basic literacy, library, media, technology and visual into information literacy provides an understanding of information being read or written in an analytical, critical and reflective way.

Cultural literacy is not a simple notion and there is no ready-made recipe or formula to develop it. The different components and the need to understand them could illustrate cultural literacy's complexity. (Broudy, 1990)

Hirsch (1987, p.2), the prominent leader of cultural literacy, published his influential book "Cultural Literacy: What every American needs to know", and referred to cultural literacy as "world Knowledge" used by Professor Jeanne S. Chall's, a reading specialist and called as core knowledge by Core Knowledge Foundation (2004). According to Hirsch (1987.p 2), cultural literacy is "the network of information that all competent readers possess. It is the back ground information, stored in their minds, that enables them to take up a newspaper and read with an adequate level of comprehension, getting the point, grasping the implications, relating what they read to the unstated context which along gives meaning to what they read." Cultural literacy is simply possessing the required knowledge for the pieces of information for any content.

McDaniel (2009) summarized the major points in Hirsch's book to include: First, everybody in a society should possess a common body of information. Second, educational institutions, mainly schools, are the most

proper ones to convey the shared information which must go beyond mere reading and writing skills. Third, the disadvantaged in society can succeed in an education that promotes cultural literacy. Fourth, cultural literacy curriculum can promote two kinds of education, an extensive one (based on the national vocabulary to be arranged in definite sequence) and an intensive one (inspires a fully developed comprehending of the subject).

Hirsch's theory of learning is in agreement with others that one learns best effectively when the incoming information is placed with the context of previously saved complexes of similar knowledge "schemata" which is connected to cultural literacy. So, it is kept in the short term memory temporarily before it is sent to the long term memory. (Ahmadi & Helmes, 1994)

To the researchers' best knowledge, a limited number of studies all around the world have been conducted to investigate the level of cultural literacy among school and university students. Meanwhile, a study conducted by Naqeeb, (2012) assures the importance of promoting cultural literacy in the EFL classrooms. He focused on the priority of having a well-organized culture empowering programs. Also, a study conducted by Colbert (2010) stated that in order to advance teaching and learning in the college classrooms, understanding of the underlying values, beliefs, perceptions and assumptions of students is required. Such understanding affects what students hear and read as well as how they express themselves in the classroom. Ochoa et al. (2016) mentioned that equipping students and professionals with the ability to read and comprehend what ever evolving cultural and disciplinary contexts so they adapt to the new experiences more effectively and with no efforts is the aim of cultural literacy. Emanuel et al. (2017) added as humans live in an increasingly visual world, society is likely to be less literate without the tools to comprehend images which are part of any culture. A need to empower students with critical and creative thinking skills is essential to living in a multimedia world.

Recently, a few studies were conducted on cultural literacy, some of which are presented below:

Hasanah (2019) conducted a study to determine the levels of family literacy and cultural literacy in families in Karawang District in Indonesia. The sample consisted of 100 mothers. The researcher used a survey. He used systematic, rational and logical way and time to collect, process and interpret the data. The results displayed low levels of literacy and the cultural literacy was in a very low level category. The results showed a

positive and significant contribution of family literacy on cultural literacy. Stimulation and monitoring programs (intervention) could be used through family literacy to improve cultural literacy.

Emanuel et al. (2017) conducted a survey study to explore the cultural literacy image. The instrument consisted of 100 images organized as 45 general images, 25 personalities, 20 events and landmarks and 10 for art and social movements. The sample consisted of 309 undergraduate students at a public co-educational university in USA, 2015. They were asked to identify the images by providing one answer per image. The results showed more than half of the respondents correctly identified 73 out of 100 images. It is concluded that cultural literacy image is an important first step in measuring literacy within a culture. It is an ongoing process as cultures constantly experience changes.

In order to maintain the local oral stories from being extinct due to modern societies. Rokhmawan & Firmansyah (2017) explored in their study the cultural literacy development based on local oral stories. The study was conducted at Kebonsari Elementary School, Pasuruan City, Indonesia and considered the students there as its sample. The researchers set two stages to finally reach the local oral stories (SBL program) which reflect the school cultural identity. The ten stories put in a book helped develop the cultural behavior of oral literacy in the surrounding environment. The study showed value of the oral- local stories as a source of advice.

Isac et al. (2011) explored the effects of six educational effectiveness models in relation to student's civic knowledge. Multilevel analysis was applied on the dataset of the IEA Civic Education Study. The study was conducted among junior secondary-school students (age 14), their schools, and their teachers. In total, 28 countries, 4,136 classrooms, and 93,565 students were counted in the analysis. The results indicated that the impacts on students' civic knowledge are multilevel. Students' civic knowledge is affected by six models in the study: individual students' variables, classroom level, country level, planning according to curricular guidelines, teachers' preparation and contextual country variables. The study concluded that schooling and educational policy do matter for students' success and influence their cognitive outcomes in this field, civics.

Canon & Jinks (1992) conducted a study to assess general scientific literacy and its relationship to age, sex, grade point average, size of high school population and current student classification (education/ business). The sample consisted of 90 university students aged between 18-24, 51 were

woman and 39 are men. The researchers used 52 terms selected from the dictionary of cultural literacy by Hirsch in which students have to identify. The results revealed no significant, predictable influences upon assessment scores attributed to age, sex, high school size or the current classification (education/ business) of the participants. However, a correlation existed between the assessment scores and the males reported grade point average but were not supported. The researchers concluded that Hirsch list of terms is general enough to serve as basis for generic scientific literacy assessment.

To conclude, one can notice that the above- mentioned studies seemed to indicate the importance of cultural literacy. However, it seemed that very few studies have been conducted on the specific fields of cultural literacy.

Statement of the Problem

Throughout the researchers' experience in teaching for a long time at universities, they have noticed that students' cultural literacy is not up to the standard expected. Even though the researchers themselves have taught different courses, different levels and students from different majors, they have some teaching semesters in which they felt disappointed by their students' general knowledge. As a result, students find it difficult to communicate properly, and they don't have that passion to learn, share, express and think openly. This has affected their total communication in such institutions. The researchers were even more concerned about cultural literacy concept when "Cultural Development" course became obligatory for all AUM students. Therefore, there is a need to explore AUM students' cultural literacy and investigate the extent to which personal factors affect such literacy.

Since AUM is a diverse institution with more than 25 different nationalities, investigating the level of students' cultural literacy is the researchers' aim to promote a world of understanding and tolerance as this is manifested in AUM's values. (Values, 2019)

Purpose and Questions of the Study

The purpose of this study was to investigate the level of scientific cultural and civic cultural literacy of the American University of Madaba students and its relationship to personal variables. The study aimed basically to answer the following questions:

1. What is the level of scientific cultural literacy among students of the American University of Madaba ?
2. What is the level of civic cultural literacy among students of the American University of Madaba ?

3. Are there any statistically significant differences at ($\alpha = 0.05$) or less in the level of science and civic cultural literacy that are ascribed to gender, high school curriculum and kind of college?

Significance of the Study

As noted above, there seems to be a gap between students' cultural literacy especially in the scientific and civic fields. It is true that students have joined AUM as they have successfully passed high school. However, they seem to lack cultural literacy needed in their university life, such lack may threaten the diversity AUM holds. The significance of this study stems from the fact that owning cultural literacy among AUM students is important. Furthermore, the study aims at adding to the field of the study evidence of the usefulness of mastering a properly knowledgeable cultural literacy among the students of the American University of Madaba. As previously mentioned, determining the level of cultural literacy in the science and civic fields AUM students' own may reflect and probably indicate the quality of students in the future especially in a reputable institution having diversity and its mission is to "prepare leaders educated in the values of ethical conduct, human understanding, astuteness, integrity and peace who are dedicated to benefitting society and resolving local and global problems and devotes its energies to the development of Jordan and the region" (Mission -AUM, 2020).

Operational Definitions of Terms:

Cultural Literacy Level (scientific, civic) the level of students' understanding and knowledge of cultural literacy in science and civics, owning the common knowledge that makes sense for someone of what s/he is reading.

Limitation of the Study:

The study is limited to AUM students from different levels and different majors who are registered in the first semester of the academic year 2019/2020. The findings are limited to cultural tests developed to test the level of scientific and civic cultural literacy among AUM students.

Method and Procedures of the Study

Population and Sample of the Study

The study population consisted of all BA students from 1st year till 5th year in both scientific and humanities faculties at AUM in the fall semester of 2019/2020 of a total number of 1361 students. With regard to the sample, the study population had been chosen in a convenient random way as the

sampling process had targeted the courses offered at AUM with the highest number of students. By this, the researchers tried to reach out the maximum number of students on a convenient basis where random levels and majors of students have been accessed. The sample included AUM students of the fall semester 2019/2020 of a total number of 437 students from different faculties.

Table 1 shows the distribution of the study sample according to gender, faculty kind and year level.

Table (1) Distribution of study sample of students at AUM according to Gender and Faculty Kind and Year Level

Faculty	Gender		Year level					Total
	Male	Female	1 st year	2 nd year	3 rd year	4 th year	5 th year	
Engineering	29	0	9	2	3	7	8	29
Science	6	34	12	10	8	7	3	40
Health Sciences	28	95	36	57	17	8	5	123
Information Technology	22	2	10	6	1	6	1	24
Business and Finance	86	52	30	43	30	29	6	138
Architecture and Design	5	17	4	5	2	10	1	22
Languages and Communication	8	53	26	22	7	6	0	61
Total for each column	184	253	127	145	68	73	24	437
Total (Gender/ Year level)	437		437					437

Instrumentation

The instrumentation consisted of a cultural literacy test. Two fields were specifically chosen for the test (scientific and civic) as they construct the mutual core of knowledge shared in the university requirements; this knowledge provides the students with the necessary background and information to be effective citizens.

The test intended to measure two fields of cultural literacy: scientific literacy and civic literacy. Therefore, the test consisted of 2 sub tests. Each subtest consisted of ten items. Each item is a statement in which the students determine if the statement is true or false on a scale of three degrees: true, false. I don't know. Those statements were chosen randomly from "Test

your cultural literacy” book by Zahler, D., Zahler, K. (2003) and also the website readfaster.com (The literacy company, 2019).

With respect to validity, the Arabic translation of the items was evaluated by an expert professor in translation at AUM. The final draft of the test was revised and edited, then reviewed by a panel of 13 experts to reduce ambiguity, ensure appropriate level of difficulty and to appraise the face validity of the selected items. The experts tried the test themselves and the list of items is agreed upon to serve as basis for general scientific and civic cultural literacy. The experts’ comments were taken into consideration as some statements were modified and some statements were replaced by others to suit the culture of the region. For instance, it was stressed by the experts to replace some statements in civics field with statements on the Arab culture as the ones about Edward Said, Naguib Mahfouz and King Abdulla the second discussion papers.

Regarding the reliability, test and re-test has been administered on a sample of 20 students from outside the sample of the study. Cronbach’s Alpha was calculated and the reliability coefficient was 0.71.

Research Procedures

To conduct the current study, the following procedures were done:

1. The researchers contacted the president of the American University of Madaba, explained the purpose of the study and got approval to proceed.
2. The researchers digitized the two fields of the cultural literacy test (the scientific and the civic) including the introduction using google forms. It has been tested by the researchers themselves more than one time and checked on different days as well before it was conducted.
3. One researcher tried the test on a Remedial English Section (not from the study sample) with 20 students and retest had been done after two weeks’ time. The test was conducted during one class time (1 hour 15 minutes).
4. Before the end of the fall semester 2019-2020, the test has been conducted on AUM students.
5. 437 responses were available on the google form sheet and ready to the next step.
6. The tests results were coded and then the data were analyzed statistically.

Research design and Statistical Analysis

The present study is considered to be a type of analytic surveys; it aims first at investigating the level of AUM cultural literacy in the scientific and

civic fields and second at determining the impact of three of the personal variables on the scientific and civic cultural literacy: Gender, kind of college, and high school curriculum.

Findings and Discussions:

The findings of the present study are discussed and interpreted with reference to the questions of the study.

Findings and Discussion Based on the First Question: What is the level of scientific cultural literacy among students of the American University of Madaba ?

Results of calculations for the first question are shown in Table 2 in which the mean scores (1-1.67) out of 3 indicates low level of cultural literacy, (1.68-2.33) indicates a medium level of cultural literacy and (2.34-3) indicates a high level of cultural literacy in science.

Table (2) Mean scores, Standard deviations, Rank, and the Level of Cultural Literacy for the Science Field among AUM students in general and for each of the items in descending order

No	Item	Rank	Mean	S.D	Level
3	The DNA is a chain of nucleotides (molecules) containing genetic information. الحمض النووي عبارة عن سلسلة من النيوكليوتيدات (جزيئات) تحتوي على معلومات وراثية.	1	2.819	0.495	High
1	The term "scientific method" refers to a process involving hypothesizing, collecting data, and testing the hypothesis. يشير مصطلح "الطريقة العلمية" إلى عملية تشمل تكوين فرضية وجمع البيانات واختبار الفرضية.	2	2.810	0.491	High
7	The best definition of a cell is the unit of structure and function of all living things. أفضل تعريف للخلية هو وحدة التركيب والوظيفة الخاصة بجميع الكائنات الحية.	3	2.794	0.545	High
4	An organism's habitat means the type of region in which it lives. موطن الكائن الحي يعني نوع المنطقة التي يعيش فيها.	4	2.540	0.816	High
5	An enzyme is a kind of virus that attacks bacteria. الأنزيم هو نوع من الفيروس الذي يهاجم البكتيريا.	5	2.426	0.814	High
2	1. To be classified as a mammal, an animal must have a three- chambered heart. يجب أن يكون للحيوان قلب من ثلاث حجرات ليتم تصنيفه من الثدييات.	6	2.416	0.754	High
6	Gregor Mendel was a Dutch scientist who classified members of the insect family. جريجور مندل هو عالم هولندي صنف أفراداً من عائلة	7	2.300	0.748	Medium

No	Item	Rank	Mean	S.D	Level
	الحشرات.				
8	Nitrogen is found in Protein but not in Carbon dioxide. يوجد النيتروجين في البروتين وليس في ثاني أكسيد الكربون.	8	2.247	0.815	Medium
9	An animal undergoing metamorphosis is changing from cold- blooded to warm-blooded. الحيوان الذي يخضع للتحويل يتغير من دم بارد إلى دم دافئ.	9	2.034	0.727	Medium
10	In chemistry, a bond is the unit used to measure the amount of a substance. الرابطه هي الوحدة المستخدمة لقياس كمية المادة في الكيمياء.	10	1.696	0.841	Medium
Total Science Section			2.408	0.248	High

It is noted from the above table that the level of cultural literacy of the students of the American University of Madaba in the overall science field was high, as the overall mean score reached (2.408) with a standard deviation of (0.248). All items of the Science field ranged between the high and medium levels, as the mean score ranged between (1.694 -2.819). Item (3) which states "The DNA is a chain of nucleotides (molecules) containing genetic information" came first at a high level, with a mean of (2,819) and a standard deviation of (0.495), followed by item (1) which states "The term "scientific method" refers to a process involving hypothesizing, collecting data and testing the hypothesis." at a high level, with a mean of (2.810), and a standard deviation of (0.491). However, item (10) which states, "In chemistry, a **bond** is the unit used to measure the amount of a substance" came in the tenth and last rank at a medium level, with an average score of (1.694) and a standard deviation of (0.841).

As noted above, the findings reveal how much students of AUM are culturally literate in the scientific field. This may indicate students are very much interested in science in general or probably the effect of new technologies and the new trend of movies and series don't ignore science terminologies and images as introduced by (Emanuel et.al 2017). The three top scores deal with DNA, the scientific method and cells which could be part of what students know or watch. Moreover, students, probably, had a very good background in science courses at school levels and at AUM which contributed in their high scores they have achieved. Further, a closer look at the items level of the field reveals a really high level of cultural literacy among AUM students in science. Six items out of 10 scored high mean scores. The present findings provide evidence of the importance of the

general scientific terms of Hirsch cultural literacy list which has been used in the researchers' study. This is in consensus with Cannon & Jinks (1992).

Findings and Discussion Based on the Second Question:

What is the level of civic cultural literacy among students of the American University of Madaba ?

Results of calculations for the second question are shown in Table 3 in which the mean scores (1-1.67) out of 3 indicates low level of cultural literacy, (1.68-2.33) indicates a medium level of cultural literacy and (2.34-3) indicates a high level of cultural literacy in civics.

Table (3) Mean scores, Standard deviations, Rank, and the Level of Cultural Literacy for the Civics field among AUM students in general and for each of the items in descending order

No.	Item	Rank	Mean	S.D	Level
15	William Shakespeare, an English poet, playwright, and actor, is widely regarded as the world's greatest dramatist. يعتبر وليام شكسبير ، الشاعر الإنجليزي والكاتب المسرحي والممثل ، أعظم مسرحي في العالم.	1	2.803	0.527	High
18	The governments of Great Britain, Sweden, and Belgium are examples of constitutional monarchies. تعتبر كل من حكومات بريطانيا العظمى والسويد وبلجيكا هي أمثلة على الملكية الدستورية.	2	2.423	0.705	High
20	The term Globalization is recent, only establishing its current meaning in the 1970s. "العولمة" هي مصطلح حديث ، تم تأسيس معناه الحالي في سبعينيات القرن العشرين.	3	2.416	0.688	High
14	Edward Said wrote <i>Orientalism</i> . كتب إدوارد سعيد "الاستشراق".	4	2.304	0.614	Medium
13	Jules Verne wrote <i>Around The World in Eighty Days</i> . كتب جولز فيرن "حول العالم في ثمانين يوماً".	5	2.265	0.683	Medium
11	Ernest Hemingway wrote <i>For Whom The Bell Tolls</i> . كتب إرنست همنغواي رواية "المن يقرع الجرس".	6	2.236	0.596	Medium
19	The Nobel Peace Prize 2019 was for Abiy Ahmed Ali "for his efforts to achieve peace and international cooperation, and in particular for his decisive initiative to resolve the border conflict with neighboring Eritrea". كانت جائزة نوبل للسلام 2019 مخصصة لأبي أحمد علي	7	2.181	0.651	Medium

No.	Item	Rank	Mean	S.D	Level
	"على جهوده لتحقيق السلام والتعاون الدولي ، ولا سيما مبادراته الحاسمة لحل النزاع الحدودي مع إريتريا المجاورة".				
12	Naguib Mahfouz is an Iraqi writer who won the 1988 Nobel Prize for Literature نجيب محفوظ هو كاتب عراقي فاز بجائزة نوبل للاداب عام 1988.	8	2.135	0.900	Medium
17	King Abdulla the second wrote eight discussion papers regarding political, economic, social, educational ...etc. issues. كتب جلالة الملك عبد الله الثاني المعظم ثماني أوراق نقاشية تتعلق بالقضايا السياسية والاقتصادية والاجتماعية والتعليمية ... إلخ.	9	1.918	0.930	Medium
16	The National Organization for Women (NOW) works to pay tuition for disadvantaged women in college. تعمل المنظمة الوطنية للمرأة (NOW) على تسديد الرسوم للدراسة الجامعية للنساء الأقل حظا.	10	1.686	0.667	Medium
Total Civics			2.237	0.256	Medium

It is noted from the above table that the level of cultural literacy of the students of the American University of Madaba in the overall civics field was medium, as the total mean score reached (2.237) and standard deviation of (0.256). All levels of the items in civics ranged between the high and medium levels, as the mean scores ranged between (1.686 - 2.803), and ranked first in item (15) which states "William Shakespeare, an English poet, playwright and actor is widely regarded as the world's greatest dramatist" with a mean score of (2,803) and a standard deviation of (0.527), followed by second place item (18) which states "The governments of Great Britain, Sweden and Belgium are examples of constitutional monarchy" with a high level, mean scores of (2,423), and a standard deviation of (0.705). However, item (16) which states "The National Organization for Women (NOW) works to pay tuition for disadvantaged women in college." was in the tenth and last rank at a medium level of (1.686) mean score and a standard deviation of (0.667).

The findings suggest that AUM students appear to have a medium level of civic cultural literacy. Only 3 items out of 10 scored high mean scores. This is not up to what is expected from them as students take civic courses on the school level and more specifically, civic awareness course at AUM which discusses many issues that are important on the local, regional and

global levels. It is surprising that AUM students are not all familiar with Edward Said, Ernest Hemingway, Naguib Mahfouz, Noble prize which might be questionable of the curriculum introduced to students. As many studies (Bojar, 1986, spooner et.al. 2009, Ursa, 2018, Isac et.al, 2011, Nageeb, 2012) emphasize the positive impact of introducing culture through curriculum and classrooms.

Findings and Discussion Based on the Third Question:

Are there any statistically significant differences ($\alpha = 0.05$) in the level of science and civic cultural literacy that are ascribed to gender, high school curriculum and kind of college?

The tables below show the results related to three variables respectively.

Table (5) Mean scores, Standard Deviations and t-test to check significance of differences of scientific and civic cultural literacy among American University Students in Madaba attributed to the gender variable

Section	Sex	N	Mean	S.D	t	DF	Sig
Science	Male	184	2.369	0.266	-2.848	435	0.005**
	Female	253	2.437	0.230			
Civic	Male	184	2.233	0.258	-0.256	435	0.798
	Female	253	2.240	0.255			

* Statistical function at the significance level ($\alpha = 0.05$) ** Statistical function at significance level ($\alpha = 0.01$)

It is noted from the above table that there were statistically significant differences at ($\alpha = 0.01$) in the mean scores of the scientific field for the benefit of female gender as the mean scores of them are higher than the mean scores comparing to the male gender. Those findings might be attributed to the nature of females being more committed to studying as Dayıoğlu& Türüt-Aşık (2007) emphasize that females excel in their studies and outperform their male counterparts and Hdü, & Fagroud (2018) mentioned that females proved to be more likely to perform better than males in different subjects.

Table (6) Mean scores, Standard Deviations and t-test to check significance of differences of Scientific and Civic Cultural Literacy among American University Students in Madaba attributed to the high school curriculum variable

Section	High School Curriculum	N	Mean	S.D	t	DF	Sig
Science	National	320	2.388	0.238	-2.922	435	0.004**
	International	117	2.465	0.265			
Civic	National	320	2.233	0.259	-0.459	435	0.647
	International	117	2.246	0.251			

* Statistical function at the significance level ($\alpha = 0.05$) ** Statistical function at significance level ($\alpha = 0.01$)

It is noted from the above table that there were statistically significant differences at ($\alpha = 0.01$) in the mean scores of the level of cultural literacy in its scientific field among American University students in Madaba due to the variable of high school curriculum, and in favor of those whom high school curriculum is international as the mean scores are higher. It is no surprise that science field is influential on the cultural literacy as the international curriculum has its own objectives and lead to many cultural wide aims. Also, international curriculum is used among many countries so most probable, the content is universal and does not rely on prior knowledge and share equal opportunities for advancement. It is in consensus with Haigh (2002) and Tatar et al. (2016) and also with the TIMSS Framework to improve education worldwide (TIMSS, 2019)

Table (7) Mean scores, Standard deviations and sample size for the level of Scientific and Civic cultural literacy among American University students in Madaba attributed to the kind of college variable

Kind of college		Engineering	Science	Health Sciences	Information Technology	Business and Finance	Architecture and Design	Languages and Communication	Total
	N	29	40	123	24	138	22	61	437
Science	Mean	2.421	2.423	2.510	2.379	2.340	2.386	2.362	2.408
	S.D	0.226	0.296	0.223	0.238	0.255	0.193	0.213	0.248
Civic	Mean	2.272	2.205	2.263	2.213	2.206	2.173	2.290	2.237
	S.D	0.249	0.253	0.244	0.277	0.263	0.203	0.272	0.256

It is noted from the above table that there were visible differences in the mean scores for the level of cultural literacy and its sub-fields (Science and Civics) among AUM students due to the kind of college variable. One Way ANOVA test was used with the aim of identifying whether the differences are statistically significant depending on the kind of college variable.

Table (8) One Way ANOVA analysis of the level of Scientific and Civic cultural literacy among American University students in Madaba due to the kind of college variable

Section		SS	DF	MS	F	Sig
Science	Between group	2.085	6	0.348	6.068	0.000**

Section		SS	DF	MS	F	Sig
Civic	Within group	24.625	430	0.057	1.469	0.187
	Total	26.710	436			
	Between group	0.575	6	0.096		
	Within group	28.062	430	0.065		
	Total	28.637	436			

* Statistical function at the significance level ($\alpha = 0.05$) ** Statistical function at significance level ($\alpha = 0.01$)

It is noted from the above table that there were differences with statistical significance at ($\alpha = 0.01$) in the mean scores of the scientific field attributed to the college variable. In order to know for whom the differences were counted, dimensional comparisons (LCD) were calculated for the least fundamental difference, which is shown in Tables (9).

Table (9) Dimensional comparisons between two score means for the sub-field (Science) according to the kind of college variable

	Mean Difference	Engineering	Science	Health Sciences	Information Technology	Business and Finance	Architecture and Design	Languages and Communication
Engineering	MD		0.008	0.089	-0.042	-0.081	-0.034	-0.058
	sig		0.975	0.072	0.530	0.099	0.612	0.280
Science	MD	-		0.087*	-0.043	-0.083	-0.036	-0.060
	sig	0.008		0.046	0.483	0.055	0.570	0.217
Health Sciences	MD	-	-		-	-	-	-
	sig	0.089	0.087*		0.131*	0.170*	0.123*	0.147*
Information Technology	MD	0.072	0.046		0.015	0.000	0.026	0.000
	Sig	0.042	0.043	0.131*		-0.039	0.007	-0.017
Business and Finance	MD	0.530	0.483	0.015		0.458	0.919	0.770
	Sig	0.081	0.083	0.170*	0.039		0.047	0.022
Architecture and Design	MD	0.099	0.055	0.000	0.458		0.398	0.542
	Sig	0.034	0.036	0.123*	-0.007	-0.047		-0.024
Languages and Communication	MD	0.612	0.570	0.026	0.919	0.398		0.686
	Sig	0.058	0.060	0.147*	0.017	-0.022	0.024	
	Sig	0.280	0.217	0.000	0.770	0.542	0.686	

* Statistical function at the significance level ($\alpha = 0.05$) ** Statistical function at significance level ($\alpha = 0.01$)

It is clear from the results of Table (9) above that there were statistically significant differences at ($\alpha = 0.05$) between the two mean scores of the sub-field (Science) in the level of cultural literacy according to the college variable, and that among their colleges (Science, Information Technology, Business and Finance, Architecture And Design, Languages and Communication) on one hand and those from the (Health Sciences) college on the other hand. It is for the benefit of those from (Health Sciences) college because the mean score for them is higher than the mean scores for those whose colleges are (Science, Information Technology, Business and Finance, Architecture and Design, Languages and Communication).

The findings were up to the researchers' expectation as Health Science faculty students have a wider opportunity to be more familiar with scientific terms and scientific concepts as part of their majors. In addition, there is no doubt that Health Sciences faculty at AUM offers the courses that lay the foundations and the basics of science and this lead to support the knowledge AUM students have in science in general, as also mentioned in the courses description (study plans, 2017). Further, developing professionals with a broad-based and scientifically strong education that empowers students with a life-long learning adaptation is the faculty mission at AUM (Faculty Mission, 2020).

Recommendation:

Based on the findings of the present study, it is recommended that further research studies should be conducted on other fields of cultural literacy and on the congruence between civic courses offered and cultural literacy. It is also recommended that more attention should be given to cultural literacy when it comes to teaching at universities, more specifically, even before to be part of every stage curriculum at school level.

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