

# THE EFFECT OF THE LANGUAGE OF INSTRUCTION ON UNIVERSITY PARTICIPANTS' ACQUISITION OF SCIENTIFIC TERMS

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## **Abstract:**

*The present study aimed to investigate the effect of the language of instruction on the participants' acquisition of the scientific terms with respect to their knowledge, usage, proficiency, adoption and evaluation in two Arab universities. The faculty members and the students of the faculties of Engineering and Medical sciences in the Jordan University of Science and Technology (JUST), where the medium of instruction is English, and the University of Damascus (UD), where Arabic is the medium of instruction, were the participants in the study. They were 991 students of different scientific fields at JUST, and 729 students at the UD. The students ranged from third-year level to graduate studies level. Also, 132 faculty members in different scientific fields at JUST, and 109 faculty members at the UD participated in the study.*

*The results of the study show that there were statistically significant differences between the means of the criteria of knowledge, usage, proficiency, adoption and evaluation of the Arabicized terms due to the effect of the language of instruction (i.e., English language) in favor of JUST, and there were statistically significant differences between the means of the criteria of knowledge, usage, proficiency, adoption and evaluation of the Arabic equivalent terms due to the effect of the language of instruction (i.e., Arabic) in favor of the UD.*

*The results of the study, also show that the percentage of the participants' responses to the items that ask about their use of the Arabicized scientific terms in JUST is 93.3%, which is higher than that in UD which was 27.8%. Also, the percentage of the participants' responses to the items that ask about their use of the Arabic equivalents in UD is 72.2%, which is higher than that in JUST which was 6.7%. The result is ultimately due to the effect of the medium of instruction at each university. In light of the findings of the study, it was recommended that research in different scientific fields other than medical and engineering fields be conducted to explore the role of the medium of instruction in the acquisition of the scientific terms.*

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## **Introduction:**

One of the biggest challenges for the Arabic language in the last few decades has been concerned with the use of English as a medium of instruction at higher education, particularly, in the areas of science and technology. Many Arab universities use English language as a language of instruction at different scientific

fields (medical, engineering, pharmacy, nursing, computer science and information technology, biology, ...etc). In this field, language planning agencies, like the various academies and establishments in different parts of the Arab World have emphasized the need for creating new terminology in Arabic in the form of word lists and specialized vocabularies to fill the gaps and to enrich Arabic with new terminology which contributed towards its development and progress.

Moreover, Arabic Language academies (ALAs) established in Damascus in 1919, in Cairo in 1932, in Baghdad in 1947, in Rabat in 1960, and in Amman in 1976, employed the process of Arabicization to create or Arabicize lists of terms among which are the technical and scientific terms that are used in Jordan and Syria. These Arabicized terms are originally borrowed from various languages such as Latin, Greek, English, French, among others. Therefore, ALAs have undertaken the responsibility of publishing and producing pamphlets of the new neologisms of standard Arabic to replace the English or other languages borrowings. Hence, the present study will, hopefully, shed some light upon the effect of the language of instruction on the participants' acquisition with respect to their knowledge, usage, proficiency, adoption and evaluation in two Arab universities, namely Jordan University of Science and Technology (JUST) in Jordan, where the medium of instruction is English , and the University of Damascus (UD) in Syria where Arabic is the medium of instruction.

### **Related studies**

A number of studies have investigated various aspects of using Arabic and English as the medium of instruction in the Arab World. In Jordan, experiments comparing the use of English and Arabic as a medium of instruction in medicine and engineering were conducted by the Arabic Language Academy in Jordan. In those experiments, 30% of the students failed when English was used as a medium of instruction as opposed to 3% failures when Arabic was used as a medium of instruction. The students covered more material, their medical knowledge was wider and more accurate, and the students saved more time and effort in studying the

material at home when Arabic was used as a medium of instruction (Abu-Hiloo and Lutfiya, 1984).

Ibrahim (1982) outlined the importance of Arabicizing the human sciences in Arab Universities. He concluded that “if we want our students to be creative and inventive, we must stimulate their imaginations by using their native language, Arabic, and provide them with Arabic resources and references” ( p. 42 ).

Zughoul and Hussein (1985) attempted to explore the needs for English at Yarmouk University in Jordan. For this purpose separate questionnaires for students and faculty were developed, piloted and distributed (Students,  $N=1147$ ; Faculty,  $N=90$ ). The questionnaires investigated three major issues: the extent of English language use at the university; perception of the students' language abilities; and perception of English language needs. The results indicated the widespread use of English in most educational settings except for class discussion and student questions in lectures. Their findings also indicated that “knowledge of English for specific purposes ... (is) ... to train students in their particular needs from the time they join the university” (p. 145). The authors drew attention to a number of ESP projects in the Arab world.

Al-Sebaee (1995), carried out an experiment on two groups of Arab medical students at the American University of Beirut and Jordan University in Amman, the experimental group studied the material in Arabic and the control group studied the same material in English. The findings showed that medical students saved 50% of their time when they read Arabic medical textbooks. In doing assignments in Arabic, 27.6% of the students would need one third of the time only, 35.9% would need half the time, and 27% would need the same amount of time to do their assignments if they were given in Arabic. Then he compared the achievement scores of the experimental and control groups in both experiments showed that the comprehension ability of the experimental group, i.e., Arabic-medium instruction, was higher than that of the control group i.e., English-medium instruction.

Shahrour (1997) conducted an electronic and telephonic survey among Arab physicians who attended medical schools and currently live in the United States of America. The purpose of the survey was to retrospectively assess the Syrian

experience in implementing translated Arabic medical sources in the Syrian universities, and the impact of this policy on subsequent performance of the graduates. Comparison between Syrian and non-Syrian Arab or non-Arab graduates was not made in this survey. All physicians were Syrian graduates and lived in the USA for an average of 7 years (2-9 years). Most of them were graduates of Damascus University Medical School, but some were from Aleppo University. Sixty-nine percent of the physicians had no difficulty in understanding Arabized medical terms and expressions in their medical schools, 24% had relative difficulty, and 7% had significant difficulty. Relative difficulties were related to the accuracy and simplicity of the translated material. Participants stressed that verbatim translation, translation by unqualified author, and the use of old uncommon Arabic terms contributed significantly to the ambiguity of some books. He added that about 42% of the participants consider the Syrian experience in translating medicine “successful,” 34% “definitely unsuccessful,” and 24% were undecided.

Al-Kateb (1999) reviewed the history of the teaching of medicine in Arabic. He considered that the experience of the University of Damascus in the field of teaching medical sciences in Arabic is a pilot experience. The University has been providing higher education to students from Syria and neighboring countries, such as Jordan, Iraq, Lebanon and Palestine since its inception. Generations of competent physicians, pharmacists and dentists have graduated from the University. They have all studied in Arabic and have been successful in their fields. Arabic did not prevent them from pursuing further studies in their field of specialization in Europe and North America. They may have met with some difficulties at first, but they were able to surmount them, using determination, patience and perseverance. In this respect, two points need to be highlighted. First, the limited number of students enabled good practical and scientific training and made direct contact with professors possible and allowed the students to benefit from their expertise. This was particularly the case with those students who, at the end of their fifth year, remained for two years as residents at the university teaching hospital. The second point is that Syrian students were proficient in French. This applied both to those who undertook school education in governmental schools and those who studied in French schools. This important

and catalytic factor enabled students to refer to foreign textbooks and travel to French-speaking countries to conduct further specialized studies. As for the students of neighboring countries studying in Damascus, they were mostly from Iraq, Jordan and Palestine. These were fluent in English as their countries were under the British Mandate, and it was also possible for them to conduct specialized studies in English-speaking countries.

Hammoud (2002) presented a historical overview of the process of Arabicization in pre-university education in Morocco. It underscored the priority given and the extreme importance accorded, by the subsequent Moroccan governments since independence from France, to Arabicizing the system of education in the country. The successes and the failures of the Arabicization campaigns were identified and analyzed. The study concluded that the Moroccan language-in-education policies have moved from the political and ideological approach of the 1950s, 1960s, and early 1970s to a more pragmatic, realistic approach. This new approach pushed in the direction of bilingualism, and may be trilingualism, in light of the need to adapt to the political and economic requirements of "globalization." In this new educational approach, Arabic will remain the basic language of communication and education; French will still serve as a medium of instruction in science and mathematics; and English will gain more ground as the global language of communication.

Nahas (2002) explored the role of the language of instruction in students' acquisition of scientific concepts in Lebanon. For this purpose, a field study was conducted using Vygotsky's theory of Zone of Approximate Development as a basis. Students from three different schools in elementary one to four classes were the subjects of the study. The language of instruction was used as the basis for comparing the results of the subjects on tests for assessing the knowledge and understanding of mathematical concepts. Results of the study showed that students studying mathematics using the native language, Arabic, have done significantly better than those using a foreign language, French, in two major domains: acquisition of the procedural operations and the ability to present them. In the fourth elementary, the difference was clear between Arabic users and French users when moving from one set of questions to a more complex one. This proves, according to the theory of

Zone of Approximate Development, the conceptual abilities of students studying mathematics develop faster and better if the medium of instruction is the students' first language.

Al-Jarf (2004) investigated college students' attitudes towards the teaching and learning of English and Arabic, towards using English and Arabic as a medium of instruction at the university level, and the types of educational reforms that need to be carried out in the light of their responses. The findings of interviews and questionnaires administered to a sample of students at the University of Jordan and King Saud University showed that 45% of the subjects prefer to educate their children at an international school where they can learn all the subjects in English at a very young age. Ninety –six percent of the students at the University of Jordan (the number of the students was 272) and 82% of the subjects at King Saud University (the number of the students was 470) believe that Arabic can be used as a medium of instruction in religion, history, Arabic literature and education, whereas English is more appropriate for teaching medicine, pharmacy, engineering, science, nursing, and computer science. The findings indicated that the students are more keen on teaching their children English than Arabic. They consider English a superior language, being an international language, and the language of science and technology, research, electronic databases, technical terminology, dictionaries, and teaching methodology. They gave many educational, vocational, technological, social reasons for favoring the English language. The study concluded that Arabic is facing a serious threat by the expansion of English language in all walks of life, lack of language planning, linguistic policies that protect, revive and develop the Arabic language, inadequate Arabicization processes in the Arab world, inadequate number of technical books translated and published in Arabic, misconceptions among college students about first and second language acquisition by children and adults, and about the language of instruction at medical and technological colleges around the world.

Al-Jarf (2008) investigated college students' views of the status of English and Arabic in Saudi Arabia in the 21st century, and their attitudes towards using English and Arabic as a medium of instruction at the university level. Findings showed that

96% of the participants consider English a superior language, being an international language, and the language of science and technology, research, electronic databases and technical terminology. Eighty two percent believe that Arabic is more appropriate for teaching religion, history, Arabic literature and education majors, whereas English is more appropriate for teaching medicine, pharmacy, engineering, science, nursing, and computer science. They gave many educational, technological, social and labor market reasons for favoring the English language. The study concluded that Arabic is facing a serious threat from the dominance of English language in higher education, because of the lack of language planning and linguistic policies that protect, develop and promote the Arabic language, because of the slow Arabicization processes in the Arab world, and inadequacy of technical material translated and published in Arabic.

Most of the previous studies investigated whether Arabic or other languages could cope with and/or replace the language of instruction found in different Arab countries. To this effect, the researchers hoped that these related studies would confirm that Arabic has the potentials for its development and vitality without threatening its purity and integrity.

### **The Purpose of the study**

The present study aimed to investigate the effect of the language of instruction on the participants' acquisition of the scientific terms with respect to their knowledge, usage, proficiency, adoption and evaluation in two Arab universities, namely Jordan University of Science and Technology (JUST) in Jordan, where the medium of instruction is English , and the University of Damascus (UD) in Syria where Arabic is the medium of instruction .

### **Research hypothesis**

The following hypothesis is tested in the study:

There are no statistically significant differences in the acquisition of the scientific terms with respect to their knowledge, usage, proficiency, adoption and evaluation due to the medium of instruction in Jordanian and Syrian universities.

## Definition of terms

### ***Arabicization***

The term 'Arabicization' is used to refer to lexical expansion which involves the rendering or coinage of new words either from existing roots, or through translation of foreign terms, and the adoption of already existing words through borrowing from foreign languages or reviving and revitalization of older usage in the same language (Sayadi, 1982). In this study, Arabicization is used as a tool to facilitate the acquisition of terminology to serve the teachability and the use of terminology in different specialized fields.

### ***Acquisition criteria***

In this study the term '**Acquisition**' is a process in which terminology interacts with the criteria (i.e., knowledge, evaluation, usage, proficiency, and adoption) of the scientific terms (i.e., Arabicized terms and their Arabic equivalents).

### **Scientific fields include the following:**

- medical fields (medicine, dentistry and pharmacy) and
- engineering fields (electrical, civil, mechanical and computer and IT).

### **Arabicized terms and their Arabic equivalents**

Some of the scientific terms (i.e., Arabicized terms and their Arabic equivalents) of the questionnaires (see Appendix 1-a and 1-b) were collected and extracted from numerous specialized books and dictionaries and taken from Arabic Language Academies publications dealing with the study topic in addition to people working in these scientific fields.

## **Limitations of the study**

*The generalization of the findings of the study is limited by the following factors:*

- 1- The present study is confined to scientific terms in Arabic taken from two scientific fields, namely medical and engineering fields.
- 2- The sample of the study, which is a purposeful one, is limited to the faculty members and students of different scientific fields at JUST and UD.
- 3- The instruments of the study are developed by the researchers.



## Participants of the study

The participants of the present study are selected purposefully; it consists of the following:

1. One hundred and thirty two faculty members at JUST, and 109 faculty members at UD. *They were included since their students will acquire the scientific terms through the instructors' usage of the terms.* Table 1 presents the distribution of the faculty members in the study:

**Table (1): The distribution of the faculty members in the study.**

University	Number of participants at Med. Fields	%	Number of participants at Eng. Fields	%	Total no. of participants	%
JUST	61	57.01	71	52.99	132	54.8
UD	46	42.99	63	47.01	109	45.2
Total	107	100%	134	100%	241	100%

- 2- Nine hundred and ninety one students at JUST, and 729 at UD. The students ranged from third-year level to graduate studies level. Table 2 presents the distribution of the students of different scientific fields in the study:

**Table (2): The distribution of the students in the study.**

University	Number of participants at Med. fields	%	Number of participants at Eng. fields	%	Total no. of participants	%
JUST	454	56.12	537	58.9	991	57.62
UD	355	43.88	374	41.05	729	42.38
Total	809	100%	911	100%	1720	100%

### **Instrument of the study**

In order to achieve the objective of the study, the researchers constructed a questionnaire. Two versions of the same questionnaire were distributed to the medical faculty members and students at JUST and UD (see Appendix 1-a), the other to the engineering faculty members and students of the same universities (see Appendix 1-b). Each version consisted of two parts. Part one included general information about the participants' background. The second part of the questionnaire included 40 items for each scientific field with their Arabicized and Arabic equivalents evaluated by the participants according to the following five criteria proposed by Cooper (1989: 61-62), :

- 1- *Knowledge*: knowledge that the term exists.
- 2- *Usage*: the actual frequency with which the term is used.
- 3- *Proficiency*: knowledge implies the ability to use the term in the right place, as defined by norms of communicative appropriateness.
- 4- *Adoption*: the complete acceptance of the term and refusal of any other term.
- 5- *Evaluation*: gaining a favorable or unfavorable attitude toward the term.

Then, each criterion was arranged in five-point scale, from one to five. After that, the average mean of the five-point criteria was obtained; it indicated the acquisition and the acceptability level of the term.

### **Validity of the instrument**

The researchers of this study established the content validity of the questionnaire before conducting this study by asking 12 specialists in the fields of teaching English as a foreign language (TEFL), translation, Arabicization, the Arabic language, language planning, measurement and evaluation, statistics and linguistics to examine the wording of the two parts of the questionnaire. Moreover, six specialists in the field of engineering and four specialists in the field of medicine checked the scientific terms of the questionnaire for content validity. The panel of experts examined the questionnaire and agreed that it did assess what it was supposed to assess.

### **Data collection procedures**

The study instrument mentioned above was used to collect the data. After taking the permission, the two versions of the questionnaire were distributed to the participants by the researchers themselves, who informed them about the purpose and the significance of the study. The researchers also asked the participants to choose only the Arabicized term or its Arabic equivalent that was more commonly acceptable by them for each English scientific term according to the five criteria proposed by Cooper (1989). Then the participants were asked to choose one point from the five-point scale under each criterion; 1 means the lowest level of the degree of acceptability of the criterion and 5 is the highest level of the degree of acceptability of the same criterion.

### **Data analysis procedures**

A survey of the answers of both versions of the questionnaire was conducted to find out the scientific terms which the participants actually acquired in their daily life. The researchers, with the help of two experts in the fields of medicine and engineering, went through the participants' responses, trying to identify any errors made which would indicate the problems that those students had in terminology acquisition with regard to the Arabicization process. The computation of the numbers of the terms most commonly acquired and those that are less commonly acquired was converted into percentages and averages. The researchers pointed out which of the items for those participants were easy to acquire and acceptable in their disciplines and which were difficult according to their responses. Finally, the obtained data were analyzed statistically to explore the role of the language of instruction in the participants' acquisition (i.e., by means of knowledge, usage, proficiency, adoption and evaluation) of scientific and technical terms. Various descriptive statistical measures (i.e., means, medians and standard deviations), the t- test and ANOVA were used to analyze statistically the collected data.

## Results of the study

The following tables present the results of the participants' responses to the items that ask about their use of the Arabic equivalents and Arabicized terms at the two universities. They also present the differences that exist in using the Arabicized terms and their Arabic equivalents by the students and the faculty members at both universities.

In order to identify the effect of the language of instruction on the participants' acquisition of the Arabicized terms and their Arabic equivalents, the t-test was used to compare the differences between the means of knowledge, usage, proficiency, adoption and evaluation of the Arabicized terms and their Arabic equivalents in the scientific fields. Table 3 presents the results of this analysis.

Table 3: Results of the effect of the language of instruction on the participants' acquisition of the Arabicized terms and their Arabic equivalents with respect to the adopted criteria

University (language)	Criteria	Terms	Means	Std. Dev.	Std. Error Mean	t. value	.Sig	
JUST (English) N = 1123	Knowledge	Arabicized	<b>4.3099</b>	0.09137	0.00722	12.550	0.000	
		Arabic eqi	4.0019	1.00975	0.07983			
	Usage	Arabicized	<b>3.9366</b>	0.13626	0.01077	8.770	0.000	
		Arabic eqi	3.6431	0.92749	0.07332			
	Proficiency	Arabicized	<b>3.9308</b>	0.10712	0.00847	8.091	0.000	
		Arabic eqi	3.5961	0.93185	0.07367			
	Adoption	Arabicized	<b>3.9152</b>	0.11241	0.00889	7.946	0.000	
		Arabic eqi	3.5881	0.93618	0.07401			
	Evaluation	Arabicized	<b>3.9194</b>	0.10777	0.00852	8.622	0.000	
		Arabic eqi	3.6412	0.94080	0.07438			
	UD (Arabic) N = 838	Knowledge	Arabicized	3.9366	0.82926	0.06556	14.286	0.000
			Arabic eqi	<b>4.1094</b>	0.51152	0.04044		
usage		Arabicized	3.2560	0.73343	0.05798	4.414	0.000	
		Arabic eqi	<b>3.3941</b>	0.41251	0.03261			
Proficiency		Arabicized	3.4694	0.78502	0.06206	7.564	0.000	
		Arabic eqi	<b>3.6407</b>	0.53038	0.04193			

	Adoption	Arabicized	3.5226	0.79360	0.06274	8.329	0.000
		Arabic eqi	<b>3.6979</b>	0.52487	0.04149		
	Evaluation	Arabicized	3.6061	0.80538	0.06367	9.520	0.000
		Arabic eqi	<b>3.7795</b>	0.54552	0.04313		

It is clear from Table 3 that t-values are statistically significant at  $\alpha = 0.05$  and there are statistically significant differences between the means of the criteria of knowledge, usage, proficiency, adoption and evaluation of the Arabicized terms and their Arabic equivalents with respect to the participants' responses which can be presented in the following manner:

- 1- There are statistically significant differences between the means of the criteria of knowledge, usage, proficiency, adoption and evaluation of the Arabicized terms due to the effect of the language of instruction (i.e., English language) in favor of JUST.
- 2- There are statistically significant differences between the means of the criteria of knowledge, usage, proficiency, adoption and evaluation of the Arabic equivalent terms due to the effect of the language of instruction (i.e., Arabic) in favor of the UD.

In order to determine the significance of the effect of the scientific fields (i.e., medical and engineering fields) on the participants with respect to the criteria of the acquisition of the scientific terms, the t-test was used. Table 4 presents the results of this analysis.

Table 4: Means, standard deviations and the t-test results of the differences between the participants' acquisition of the scientific terms due to the scientific fields.

University	Scientific fields	Participants	N	Means	Std. Dev.	Std. Error Mean	t. value	.Sig
JUST	Engineering	Students	537	3.8753	0.49186	0.02123	3.366	0.001
		Faculty members	71	<b>4.0646</b>	0.45377	0.05385		
	Medical	Students	454	<b>4.0943</b>	0.056397	0.02647	1.402	0.162

		<i>Faculty members</i>	61	3.9831	0.69938	0.08955		
<b>UD</b>	Engineering	<i>Students</i>	374	3.4710	0.55520	0.02871	3.798	0.00
		<i>Faculty members</i>	63	<b>3.7593</b>	0.56954	0.07175		
	Medical	<i>Students</i>	355	3.6998	0.55597	0.02951	5.329	0.00
		<i>Faculty members</i>	46	<b>4.15378</b>	0.43279	0.06381		

It is evident from the table that the students' acquisition of the scientific terms in the medical fields is higher than the faculty members at JUST, while the students' acquisition of the scientific terms in the engineering fields is less than the faculty members at the same university. Moreover, the students' acquisition of the scientific terms of the medical and the engineering fields is less than the faculty members' acquisition in the UD. Whereas, the faculty members' acquisition of the scientific terms in the engineering fields at JUST is higher than in the UD, while the acquisition of the scientific terms of the medical fields at JUST is less than in the UD.

In order to examine the differences between the Jordanian and Syrian universities (i.e., the medium of instruction at JUST and the UD) on the means of participants' acquisition of the scientific terms due to the university, the t-test was used. Table 5 presents the results.

Table 5: Means, standard deviations and the t-test results of the differences between the participants' acquisition of the scientific terms due to the university.

<b>University</b>	<b>Participants</b>	<b>N</b>	<b>Means</b>	<b>Std. Dev.</b>	<b>Std. Error Mean</b>	<b>t. value</b>	<b>.Sig</b>
JUST	<i>Students</i>	991	3.9659	0.53896	0.01712	1.212	0.226
	<i>Faculty members</i>	729	4.0269	0.57942	0.02100		
UD	<i>Students</i>	132	3.5824	0.56687	0.05043	5.919	0.00
	<i>Faculty members</i>	109	3.9257	0.55005	0.05269		

It is evident from Table 5 that there are statistically significant differences between the means at  $\alpha = 0.05$  of the faculty members' responses at UD and the students' responses in the same university, but there are no statistically significant differences at  $\alpha = 0.05$  between the means of the faculty members' responses at JUST and the students' responses in the same university due to the effect of the language of instruction in each university.

Table 6 presents the results of the participants' responses to the items that ask about their use of the Arabic equivalents and Arabicized terms at the university level.

Table 6: The results of the participants' responses of using Arabicized terms and their Arabic equivalents at the university level.

University	Arabicized terms		Arabic equivalent terms	
	Av	%	Av	%
JUST	1048	93.3	75	6.7
UD	233	27.8	605	72.2

### Discussion of the results

The results indicated that there was an obvious effect for the medium of instruction on the acquisition of the scientific terms in both universities. Such significant differences between the participants' responses in JUST and the UD could be attributed to the possibility that Arabicized terms were more used in JUST than in the UD such as '**ntën**' "antenna", '**nti frëz**' "Anti freeze", '**bärumitar**' "Barameter", '**buylr**' "Boiler", '**si di**' "Compact Disc", '**llktrusz**' "Eelectolysis", '**Inçalby**' "Enthalby", '**bi si**' "Personal Computer", '**radär**' " Radio Detection and Ranging", '**ydz**' "AIDS: *Acquired Immuno-Deficiency Syndrome*", '**nṭräks**' "Anthrax", '**munya**' "Ammonia" '**zmah**' "Asthma", '**kabsulah**' "Capsule", '**mikrusküb**' "Microscope", '**tilisküb**' "Telescope", '**tuksimya**' "Toxemia" 'tüksinät' "Toxins", '**Stätiki**' "Static", '**bistun**' "Piston", '**at'yun**' "Ionization" ....etc, and that Arabic equivalent terms were more used in the UD than in JUST such as '**hawë**' "Antenna", '**mänc litajammud**' "Anti

freeze”, ‘miqyäs aḍaght aljawë’ “Barameter”, ‘**mirjal**’ “Boiler”, ‘lqrš Imudmaj’ “Compact Disc”, ‘kahralh (atañlil ilkahrubë)’ “Electolysis”, ‘Imuñtwa lñrari lkuli’ “Enthalpy”, ‘ñasub shakhši’ “Personal Computer”, ‘**lkashüf**’ “ Radio Detection and Ranging”, ‘mrđ nqš almnac’ almuktasabh’ “AIDS (*Acquired Immuno-Deficiency Syndrome*)”, ‘Alajmrah alkhabīṭah’ “Anthrax”, ‘**Nashādir**’ “Ammonia”, ‘rabu’ “Asthma”, ‘miñfaḍah’ “Capsule”, ‘**mijhar**’ “Microscope”, ‘**almiqrāb**’ “Telescope” ‘ssamdamiyah ( tasamum ’ddam)’ “Toxemia”, ‘**sumüm**’ “Toxins”, ‘**Sukuni**’ “Static”, ‘**makbas**’ “Piston”, ‘ **tasharud**’ “Ionization” ....etc. In such a case, the medium of instruction used in these universities may have contributed to such a result. This result agrees with the results which were reached by Ibrahim (1982), Al-Najjar (1984), Mouakket (1986), Ali (1987), Shahrour (1997), Nahhas (2002) Jabak (2007) and Al-Jarf (2004 and 2008).

For Al-Najjar (1984), English words which were transferred into Arabic by this method (i.e. Arabicization) and which preserved their English pronunciation are very rare. But the present researchers have found that, the participants of the study remarked on the difficulty of giving exact Arabic equivalents for such items, so they use Arabicized terms more than Arabic equivalents in Jordan because the medium of instruction in JUST is English. Whereas, the participants in Syria used Arabic equivalents more than Arabicized terms because the medium of instruction in the Syrian universities is Arabic (see Table 6). In such a case, this rare usage could be related to the medium of instruction used in each country, despite the fact that the percentage of using Arabicized terms among the participants in the UD is (27.8%).

The obtained data indicate that there are significant differences between the means of the *students’ responses* at JUST and the *students’ responses* at the UD with respect to the criteria of acquisition of the scientific terms due to the effect of the language of instruction in each university. The reason behind such result is due to the fact that the students should acquire an adequate number of terms and should know how to use them accurately in order to communicate well in a foreign language. Therefore, the students of the UD and JUST acquire the language of the scientific terms in instructional situations. They are exposed to thousands of different scientific terms whether Arabicized or Arabic equivalent terms. Some, because of the special



circumstances they are in, pick up a foreign language in the same way they learned their mother language. But it is natural that even in these situations, the processes of acquiring the scientific terms (i.e., by means of knowledge, usage, proficiency, adoption and evaluation) and the capacity that goes into the acquisition of the language are made use of in acquiring the scientific terms.

Moreover, the obtained data show that there are no statistically significant differences between the means of the faculty members' responses at JUST and the faculty members' responses at the UD with respect to the criteria of acquisition of the scientific terms (i.e., Arabicized terms and their Arabic equivalents) due to the effect of the language of instruction. The reason behind such result is due to the fact that these scientific terms are familiar and well-known to the faculty members at JUST and the UD such as '**radār**' "Radio Detection and Ranging", '**ydz**' "AIDS (*Acquired Immuno-Deficiency Syndrome*)", '**kabsulah**' "Capsule", '**lformik**' "Formic", 'lyzr' "Light Amplification by Stimulated Emission of Radiation", '**stalayt**' "Satellite", 'laktüz' "Lactose"...etc. In addition, the faculty members at JUST and the UD have an extensive ability, awareness, a high usage and a solid knowledge of the Arabicized terms and their Arabic equivalents. Furthermore, the faculty members at JUST and the UD have a good command of Arabic and English language.

One may argue that the students of the study are influenced by the medium of instruction and they are very conscious about their working languages. The obtained data may provide more reliable statistical evidence to support this argument.

The results indicate that the criterion of knowledge of the Arabicized and the Arabic equivalent terms among the students in the UD and JUST is higher than the criteria of usage, proficiency, adoption and evaluation. It would seem, therefore, that the best foundation for terminology acquisition is provided by the knowledge of the scientific language.

It was mentioned earlier that the lack of terminological knowledge is the greatest initial obstacle to learn scientific language. So, the students are able to update their working knowledge of the scientific language whether it is Arabic or English language across the curriculum. This result goes in line with that of Nation (1990). The present research findings are supported by Huckin's belief (1986) that vocabulary knowledge

is the most important linguistic variable in SL acquisition and performance. It seems apparent that the knowledge of technical and scientific terms is the driving force of the scientific language.

Finally, it is evident from the results that English as a medium of instruction continues to dominate the scientific fields at the university level. It continues to be an exclusive medium in the medical and the engineering fields because it is used all over the world, whereas Arabic is used in some countries. Moreover, English is the language of science and technology, research, and economy. It is an international language. Most the books, periodicals, papers, and electronic databases essential for the intensive and extensive study of an academic subject, are available in English. Crystal acknowledged that its use as a *lingua franca* was closely connected with its rise as a world language (Crystal, 1997). According to him (1997), “a language achieves a genuinely global status when it develops a special role that is recognized in every country”(p. 237).

Some argue that using Arabic as a medium of expression of the scientific language is driving the Arab world away from the world of medical and engineering research and if we teach medicine and engineering in Arabic, we will be unable to communicate with the world. Firstly, counter evidence to such claim is found in Table 3. The analysis indicated that there are statistically significant differences between the means of the Arabicized terms and their Arabic equivalents due to the acquisition of the scientific terms at UD in favor of the Arabic equivalent terms. This means that the acquisition of the scientific terms in the mother tongue (Arabic in our case) is much more efficient than the acquisition of the scientific terms in the second language. Consequently, Arabic is the dominant language in UD. This result is also supported by Thirumalai (2003). He states:

*Mother tongue is the first known, the most familiar and the closest of all languages to a child. Because of the above, mother tongue offers the most meaningful system of signs, which works with greater speed and facility than a system of signs offered by another language. A child using a language other than his own mother tongue will have problems of adjustments - linguistically, socially and culturally. Use of a language other than mother tongue will inhibit the*

*intellectual growth and development, and thinking processes. Emotional stability is better achieved through a use of mother tongue ( p. 185).*

Secondly, it is also commonly agreed upon that Arabic was the scientific language that was long used worldwide by numerous nations brought under the sway of Muslim civilization from the third Hijri century (890 A.D) until the seventh Hijri century (1290 A.D). Later on, Latin substituted Arabic (Sharaf, 1928). However, translation activity was unsteady. It flourished in some epochs and deteriorated or completely vanished in others. Al-Jemiliyy (1986: 31) mentions that Muslim translators at Bayt al-Hikma (House of Wisdom) in Baghdad, which witnessed the greatest flowering of translation in the Abbasid era, translated works from Persian, Indian, Greek, and Roman languages into Arabic, particularly during the reign of Al-Ma'mun, who encouraged specialists to translate philosophical books into Arabic. A few distinguished translators like Yuhanna bin al-Bitriiq and Ibn al-Humssii favored literal translation, whereas others, like Hunayn bin Ishaq and al-Jawharii, favored free translation (Hassan, 1970; al-Jemiliyy, 1986; al-Khourii, 1989; Khulusi, 2000).

### **Conclusion:**

The following conclusions have been drawn from the results of the study:

1. The students can acquire scientific terms more quickly and actively through the medium of instruction whether it is a mother tongue or a foreign /second language.
2. Lack of knowledge is one of the most important reasons behind the low acquisition of scientific terms. A student who does not know a term will not be able to use it, to be proficient in it, to adopt it, or to evaluate it. Then, s\he will not acquire the term.
3. Students fluent in the foreign language or the mother tongue should be able to be better in acquiring the scientific language.
4. It must be admitted that it is difficult or even impossible to eliminate all Arabicized terms of technical and scientific fields and replace them with Arabic equivalents, because some of these borrowed terms are absorbed and integrated

in Arabic. They are approximately morphologically and phonologically treated as if they were Arabic.

5. Arabic has not developed its own scientific register for each discipline of the scientific fields. This conclusion goes in line with that of Ilyas (1989). This constitutes a genuine problem in translating scientific terms into Arabic and in the use of Arabic equivalents.
6. It must be admitted that many of the Arabic scientific terms being used nowadays vary from one country to another because every Arab country, unfortunately, is working independently in translating the numerous neologisms of technology into Arabic. Also, many Arab countries have established Arabic language academies to provide their respective countries with the required Arabic terminology. Each Arabic academy chooses an Arabic equivalent well-known in its country.

**Recommendations:**

In the light of the findings of the study, the researchers recommends the following:

- 1- Using Arabic in our education as a medium of instruction and a tool of expression would decrease the unjustifiable excessive use of the Arabicized terms, because the abundance of Arabic scientific terms that are virtually suitable as formal equivalents can satisfy the need of translators and specialists searching for Arabic equivalents. So, “every effort should be made to provide education in the mother tongue” (UNESCO, 1951).
- 2- Using Arabic as a medium of expression of the scientific language does not mean abandoning English or any foreign language. What is meant is to learn in our mother tongue while keeping and maintaining a good knowledge of other languages. This can greatly facilitate and enhance terminology acquisition in particular and language acquisition in general.
- 3- It is recommended that knowing the attitudes of specialists in the field concerning the standardization and unification of Arabic terminology in general and technical terms in particular helps higher authorities of Arabicization, like different Arabic language academies, in their plans and projects to benefit from the specialists’ opinion beside having the findings of this research as evidence for the bad need for unifying Arabic technical terms.
- 4- A unified Arabic information bank or a unified Arabic center for translation should be established. It must include specialists in the field for rendering the new scientific terms to cope with the enormous flow of scientific and technological terms that need Arabic equivalents.
- 5- There should be an open channel of communication among Arabic language academies to coordinate their efforts to unify and standardize the use of Arabic terminology in all fields.
- 6- Further research in different scientific fields other than medical and engineering fields is needed to explore the role of the medium of instruction on the acquisition of terms.

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