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Students' technological awareness at the College of Education, Qatar University

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Abstract

"Technology at the level of university education has become an important basis for designing educational curricula, and it is considered one of the most essential elements of teaching in our time, especially creative teaching based on employing critical thinking skills and problem-solving method. The use of technological applications and their use in managing the educational process and organizing it within institutions Is considered one of the most critical foundations of quality standards. Still, instead, it is a component of the quality of the educational process. This study seeks to confirm the extent of the technological awareness of students at the College of Education at Qatar University before going on to training in the field by adopting a descriptive method to measure the students' technological awareness levels .The study was applied to all students of the College of Education at Qatar University distributed on eight specializations. The number of students in the college for the academic year 2020/2020, in which the questionnaire was, applied 2063, 17.9 % responded to the study instrument, equivalent to 371 students .The results of the study showed that the general level of both the emotional and cognitive fields of technological awareness is high, and the level of awareness of the skill field was average. The results revealed that there are no differences in all dimensions of Technology about sex, specialization, or nationality. While the study found technological awareness increases with the number of years of study and the level of academic performance. A set of recommendations was proposed in light of the study results, Such as the College of Education holding workshops and seminars specializing in Technology, adding a course in educational technology for students in the secondary education program in particular, and providing courses in Technology first-year students.

Keywords: Technology; teaching; learning; awareness; Qatari students

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1. Introduction

Due to the advancements, which are accelerated world has unbeatably seen, technological developments have not become an important nerve for wealth and comfort and must be used and extracted from education, an absolute necessity for our everyday life. Technology has become the backbone of life, and it is necessary to exploit it in education and benefit from it, which is an essential requirement in our daily lives. Technology moves the world without exception, whether they are individuals or institutions, because of its significant impact when used in the educational field.

The current social, economic, and political conditions have imposed that dealing with Technology and technological awareness is obligatory for everyone who deals with these new technical resources. The contemporary visions revealed how learners have a tendency to use Technology and how their learning influences when using Technology, it has been exposed that the use of digital technology and students' interactivity and learning is growing. (Nagasubramani, 2018).

Dealing with Technology is an obligation on societies to be consistent or not in line with the requirements of the modern era and its technological developments. Technology affects our lives considerably; there is no question that Technology plays a significant role in every sphere of life. Technology means that all our regular, complicated tasks can now be quickly and powerfully programmed. From education to business, everything has now become digitalized, this is indeed the computer age, and this high-intensity impact of digitalization has changed the face of the world. (Anunobi, 2015).

Due to the numerous advantages of Technology and every field is now upgrading its infrastructure besides installing Technology where possible. The best example of this is the change in our educational institutes, where in the past, education was limited to the physical contact between teachers and students in a class. Now every sector is computer-based, and people are inclined towards using technological systems to assist them. Classrooms across the globe have implemented many modes of Technology to boost student interest and accomplishment. Student participation and inquisitiveness had also increased because of the perpetuation of Technology. Thus, it would not be wrong to say that we live in the era of science, engineering, and Technology. (Bindu, 2017).

The youth of today is inclined towards using Technology more efficiently. They weigh the pros and cons of implementing them in their studies and professional careers to become more successful. The advantages that are bought with this revolution of the educational institutes, with the development of new systems has a significant impact on human life, and it can lead to outcomes of significance magnitude, which will further aid in the progress of nations (Wang & Calvano, 2013).

The utilization of Technology in the classroom to allow teachers and students to discover a new interface of life is of vital significance. The role of technology in education is to create a better instructional syllabus, learning content, and provide better services. With advancements in every field of life, technological development must be incorporated in the classrooms and educational institutes. It can play a fundamental part in education, to formulate a new and advanced functional syllabus (Tormo-Carbó et al., 2018).

Classroom technologies help students and teachers in the practice of accomplishing and providing education systematically. Teachers are studying and implementing the most recent technology in the classrooms. Governments are now taking charge of financial investment in universities and ensuring the implementation of the latest technology to ensure that students understand its efficient usage. That is why it is critically important for universities to implement innovative learning materials for laboratories and classes. The use of technologies in universities has increased the amount of precision in educational materials to higher standards (Malik et al., 2019).

Generally, the objective of education for people now a day is to obtain enough knowledge to attire a skill and make a profession. Computer schooling is vital in universities, as you cannot make youth employable without including Technology in classrooms (Mcgowan et al., 2015).

Today's younger generation is far more curious to use technology resources. Teachers can alter creativity into pupils' heads by utilizing technology tools. Social Media like Facebook, Twitter, etc. are prodigious technology platform, which may help teachers to instruct about socialism and social science issues in classrooms (Meerza & Beauchamp, 2017).

The significance of communicating technologies within the discipline of instruction is quite beneficial. Therefore, states want to update their systems in a fast and must upgrade schools, education, or college system with the support of Technology (Muehlhauser, 2015).

An implementation of a technological instrument in the students learning process is essential. The benefits of taking online courses are a whole lot more than its disadvantages. However, teachers must teach students how to understand engineering and computers. It is essential that they need to be aware of internet security and privacy policies and frauds occurring with all the young generation (Ruiz-Palomino et al., 2019).

Some studies have emphasized the importance of technological awareness among students, as a study of (Stocklmayer & Gilbert 2002), (Potts, 2012) and (Chaman & Dahiya, 2016).

Also, some studies confirmed that using technological tools increases and support students learning. In 2011, Azikiwe, Obidike, and Enemou were conducted to find out about teachers' nursery and primary schools' awareness of the technological resources that could be used to support and to enrich children's literacy instruction. The study was conducted in Nigeria, and the research sample consisted of 500 nursery and primary school teachers using a questionnaire for collecting data. The results indicated that both nursery and primary school teachers could recognize the technical tools that could enhance children's literacy learning but are not aware of how to use these resources.

The use of Technology by teachers is an essential issue in education. In 2019 Al-Mohammed conducted a study of 208 teachers to find educators' opinions on the factors influencing digital citizen ethics among secondary school students in Jordan. The study included many variables such as gender, experience, educational qualification and training courses. The results show that all the ese factors affect the values of digital citizenship among secondary school students. The study recommends teachers using information technology for digital culture and ensuring equal access to appropriate digital tools and resources to meet all students

' needs.

Some studies measure the impact of technological awareness and digital citizenship, such as that of Al-shewieli, who conducted a study in 2018 to find the technical awareness of 149 social studies teachers and its relation to digital citizenship. The results show that some variables do not affect, such as specialization and scientific qualification. However, there are effects of experience, in favor of 5-10 years of experience, and awareness level according to gender, in favor of males. In general, the study results show a high level of technological awareness in the knowledge and skill domains, and a positive relationship between the level of technical awareness and the digital citizenship concept. These results prompt the researcher to recommend an emphasis on the importance of technological awareness for teachers.

To learn more about the technological awareness of university students, Khalaf Allah conducted a study in 2016 comparing the effect of using traditional cooperative learning and using collective learning in electronic forums in the development of knowledge and the practical side of technological awareness

among students of the Faculty of Education, Al-Azhar University. To achieve the research goals, the researcher used a descriptive approach and an experimental approach to determine the effect of the program based on cooperative learning in electronic forums (traditional collaborative learning vs. automated cooperative learning) on both knowledge acquisition and the practical side of technological awareness. The results of the research show that the group that used collaborative learning in electronic forums was better than those that used traditional cooperative learning in achievement and functional performance.

Kansarah (2010) conducted a study measuring the level of technological culture among students of educational preparation at Umm Al-Qura University. The study sample was 415 students randomly chosen from the whole community. The results show that the level of technological culture among students was relatively good, with differences of statistical significance by gender. There were differences in student performance on the overall test in favor of male students with excellent GPAs. In light of the results, the researcher recommends updating and developing educational inputs and improving techniques, practices, and evaluation methods that support all students. The Ministry of Higher Education should take care of the cognitive and technological aspects, giving them sufficient and balanced attention when developing plans, and introducing scholarly communication and computer subject matter at the educational preparation stage.

The development of technological awareness at all stages is necessary for all students. In 2008, Ahmad conducted a study aiming to build a technology education program to increase technological awareness and the skills to deal with modern technical applications. To formulate the program, the researcher used a cognitive test, a list of the capabilities needed to cope with modern technological demands, and a list of current technical applications. The program was tested by students to identify its effectiveness in increasing their technological awareness and skills for dealing with modern technological applications in high school. The study found an effect of the proposed program on raising awareness, and both the cognitive skill of the students and their ability to deal with modern technological applications after applying for the program. The study recommends implementing a technical education curriculum to enable students to connect with the educational environment and the business market and providing highly qualified teachers to teach this curriculum.

Using and employing Technology with a high level of skill is very important for college students because, after completing their theoretical study at the university, they go on to practice in the field for ten weeks, beginning as a classroom viewer and gradually gaining the full roles and responsibilities of a teacher. Students must be familiar with how technology is incorporated into education, which enhances their teaching skills and raises their performance. Therefore, this study seeks to confirm the extent of awareness of the technological aspects of learning by students at the College of Education before training in the field.

Vinnaras and Rekha carried out research in 2020 focused on Student-Teachers heir and their teaching and learning attitude and understanding about information and communication technology. Their researchers used a survey of teacher training colleges in India, and student teachers studying at teacher training colleges were a sample. The researchers' goal was to encourage teacher educators and curriculum retainers to improve ICT skills and attributes, which are essential for teacher training in contemporary society. The article suggests and addresses some changes and improvements to the knowledge and skills of student teachers to provide a significant understanding of and attitude to the ICT world as well as sustainable development.

Research questions and objectives:

This study is conducted to reveal the level of Students' technological awareness at the College of Education, Qatar University.

This study aims to answer the following questions:

1: What are the technological awareness of students of the College of Education at Qatar University for each technical awareness dimension?

2: What are the level of technological awareness among the students for each item for each technological awareness dimension?

3: Are there any statistically significant differences in the level of technological awareness between students based on gender, identity, cumulative average, specialization, type of program, and the number of years of study?

The study focuses on the level of technological awareness among the students for each item of each technical awareness dimension. The value of this study stems from:

Continuing to meet the needs of the job market of qualified graduates by integrating Technology in education in line with the strategy of integrating innovations in education at the Ministry of Education and Higher Education in Qatar.

The College of Education at Qatar University may take the results of this study, and add some courses related to Technology directly in the deliberate plans of intent in the academic departments.

They are encouraging researchers from other colleges at the university to do similar research to measure students' technological awareness, especially in light of the Corona pandemic conditions experienced by the world and the need to support and integrate education with Technology.

2. Methods

2.1 Design and development of research data

The research adopts a descriptive approach to measuring students' technological awareness at the College of Education, Qatar University. The researcher uses a 50-item questionnaire to generate data, covering three dimensions: knowledge, emotion, and skills. The researcher reviewed many studies in the field before designing the questionnaire, including Ahmad (2008), Al-shewieli (2018), and Al-Mohammed (2019). Based on these studies, a scale for the three dimensions is constructed, with 10 item s for the knowledge dimension, 18 for the emotional aspect, and 20 for the skills dimension, 50 in total. Some of the item s are positive, and some are negative. A Likert three-point scale is used to grade their reaction to each expression (agree, not sure, not agree).

2.2 Reliability and validity

To ensure validity, the tool presented to individual judges who specialize in educational Technology and faculty members of universities, for their views on the reliability of the content of the questionnaire, the following questions were directed to the arbitrators to answer them:

1 - Does the questionnaire contain sufficient information to cover what it is supposed to measure?

2- Are the questionnaire questions appropriate, and did I measure the area to be measured?

3 - What level of proficiency is measured by the content of the questionnaire?

The arbitrators answered these questions, their answers were satisfactory, the percentage of agreement among them on the suitability of the questionnaire paragraphs was more than 90%, and this percentage expresses that the content of the questionnaire is acceptable and reasonable.

TO calculate the reliability, the Cronbach's alpha is calculated, and Table 1 shows the internal consistency of the students' technological awareness of the questionnaire. A pilot study was undertaken with 40 students to test the tool.

Table 1: Internal consistency

Dimension	Item No.	Cronbach's Alpha
Knowledge dimension 1-12	12	74.6
Emotional dimension 12-32	20	73.4
Skills dimension 33-50	18	78.3
Total	50	87.8

Table 1 shows that the Cronbach's alpha coefficient ranges from 73.4 to 78.3. for the dimensions and is 87.8 for the whole questionnaire; this means that the research sample's internal accuracy is high and very strong.

2.3 Study sample

The research population is all the students in the educational faculties at Qatar University, in the academic year 2019/2020. The population numbered 2,063 from 8 specializations. The sample was 371 students, male and female, and the proportion of the population was 17.9%.

Table 2: Demographic variables of the study sample (N=371)

Variable	Category	Frequency	Percentage
Gender	Male	35	9.4
	Female	336	90.6
Program type	Primary	182	49.1
	Secondary	189	50.9
Specialization	Social studies	86	23.2
	Arabic language	93	25.1
	English language	14	3.8
	Mathematics	30	8.1
	Sciences	37	10.0
	Early childhood	45	12.1
	Physical education	27	7.3
	Special education	39	10.5
Study year	First	33	8.9

	Secondary	86	23.2
	Third	80	21.6
	Forth	120	32.2
	More	52	14.0
Cumulative average	1 – 1.9	20	5.4
	2 – 2.9	176	47.4
	3 – 4	175	47.2
Identity	Qatari	280	75.5
	Non-Qatari	91	24.5

As shown in Table 2, 371 participants agreed to participate in the study and the response rate was 100%. Arabic language had the highest sample response (25.1% [n=93]), and English language had the lowest (3.8% [n=14]). Most participants were in the fourth academic year (32.2% [n=120]) and the cumulative average of the GPAs of the students was between 2-2.9 (47.4% [n=176]) and 3-4 (47.2% [n=175]) for most participants. Most of the sample was female (90.6% [n=336]) and had Qatari identity (75.5% [n=280]). Just over half the sample were undergoing the secondary programme (50.9% [n=189]), while 49.1 % [n=182] underwent the primary programme.

3. Results:

To answer the first question concerning the technological awareness of students of the College of Education at Qatar University, the mean, standard deviation, rank, and degree for each technological awareness dimension is calculated.

Table 3: Mean, standard deviation, rank, and degree for each dimension

N	Dimension	Mean	SD	Rank	
1	Knowledge dimension	2.40	.29	2	high
2	Emotional dimension	2.44	.32	1	high
3	Skills dimension	2.31	.35	3	moderate
	Total	2.39	.26		high

Table 3 shows that the overall level of technological awareness is 2.39 in all aspects and of a high degree in total. In detail, dimension 2, the emotional dimension, ranked first with a mean of 2.44, while dimension 3, the skills dimension, ranked last with a mean of 2.31 and a moderate degree.

To answer the study's second question regarding the level of technological awareness among students, the researcher calculates the mean, standard deviation, rank, and degree for each dimension.

Table 4: Mean, standard deviation, rank, and degree for the knowledge dimension

N	Item	Mean	SD	Rank	Degree
1	Knowledge of ICT and telecommunications is included in the relevant curriculum in my specialization.	2.61	.52	1	high
9	I follow with eagerness the conferences and symposiums on employing Technology in the teaching curriculum related to my specialization.	1.97	.69	9	moderate
	Total	2.40	.29		high

Table 4 shows the results for the levels and ranks of the highest and the lowest-scoring item s in the knowledge dimension. The overall technological awareness of students in the knowledge dimension had a general mean of 2.40, with a high degree, and item 1, relating to knowledge of ICT and telecommunications in the relevant curriculum, ranked first, with a high degree, while Item 9, "I follow with eagerness the conferences and symposiums on employing technology in the teaching curriculum related to my specialization" ranked the last rank, with a moderate degree

Table 5: Mean, standard deviation, rank, and degree for the emotional dimension

N	Item	Mean	SD	Rank	Degree
25	I adhere to ethics laws and regulations using Technology in the teaching curriculum related to my specialization	2.72	.50	1	high
19	I prefer to use new technologies only at one stage of the lesson if I have to.	1.79	.75	20	moderate
	Total	2.44	.32		high

Table 5 shows the results for the levels and ranks of the highest and lowest scoring item s in the emotional dimension. The level of technological awareness of students in the emotional dimension had a total mean of 2.44, with a high degree. Item 25, which says, "I adhere to ethics laws and regulations using technology in the teaching curriculum related to my specialization," ranked first, with a high degree.

Item 19 says, "I prefer to use new technologies at only one stage of the lesson if I have to," ranked last, with a moderate degree.

Table 6: Mean, standard deviation, rank, and degree for the skills dimension

N	Item	Mean	SD	Rank	Degree
33	I can effectively use educational websites to teach the curriculum related to my specialization.	2.52	.61	1	high
49	I do not have the skills to use various statistical and data analysis software in the curriculum topics related to my specialization.	2.02	.72	18	moderate

Total	2.31	.35	moderate

Table 6 shows the results for the levels and ranks of the highest and lowest scoring item s in the skills dimension. The level of technological awareness of students in this dimension had an overall mean of 2.31, with a moderate degree. Item 33, which says, "I can effectively use educational websites to teach the curriculum related to my specialization," ranked first, with a high degree.

Item 49, which says, "I do not have the skills to use various statistical and data analysis software in the curriculum topics related to my specialization," ranked last, with a moderate degree. The reason for this is that there are no courses in the College of Education that teach the basics of educational statistics.

The third question of the study concerns any statistically significant differences in the level of technological awareness between students based on gender, identity, cumulative average, specialization, type of program, and a number of years of study. To find the differences between the means of technological awareness based on the gender variable, a student's t-test analysis is carried out, with the results shown in Table 7.

Table 7: T-test by gender

Dimensions	Variable category	Mean	SD	FD	T-value	Sig
Knowledge dimension	Male	2.34	.34	370	1.24	0.220
	Female	2.41	.29	370		
Emotional dimension	Male	2.38	.31	370	1.16	0.250
	Female	2.45	.32	370		
Skills dimension	Male	2.25	.37	370	0.935	0.335
	Female	2.31	.35	370		
Total	Male	2.32	.30	370	1.267	0.213
	Female	2.39	.26	370		

Table 7 shows no statistically significant difference in any dimension according to gender, with a significance value higher 0.05.

Table 8: T-test by program type

Dimension	Variable category	Mean	SD	FD	T-value	Sig
Knowledge dimension	Primary	2.44	.25	370	0.257	0.034
	Secondary	2.37	.33	370		
Emotional dimension	Primary	2.48	.31	370	0.458	0.035
	Secondary	2.41	.32	370		
Skills dimension	primary	2.31	.36	370	0.156	0.780

	Secondary	2.30	.35	370		
Total	Primary	2.41	.25	370	1.44	0.150
	Secondary	2.37	.28	370		

Table 8 shows a slight difference in favor of the primary program in the first dimension (knowledge) and the second dimension (emotion) over the secondary program. Reference to the values of the means shows that the difference is in favor of the primary program.

Table 9: One-way ANOVA test for the differences between means by specialization

Dimension	Difference	Sum of square	FD	Mean of square	F- value	Sig
Knowledge dimension	Between groups	.447	6	.074	.831	.546
	Within groups	32.509	363	.090		
	Total	32.956	369			
Emotional dimension	Between groups	.871	6	.145	1.413	.208
	Within groups	37.165	362	.103		
	Total	38.036	368			
Skills dimension	Between groups	.919	6	.153	1.200	.306
	Within groups	46.234	362	.128		
	Total	47.154	368			
Total	Between groups	.375	6	.062	.858	.526
	Within groups	26.131	359	.073		
	Total	26.506	365			

Table 9 shows no statistically significant difference in any within or any dimension according to specialization because the significance value is higher than 0.05.

Table 10: One-way ANOVA for means by years of study

Dimensions	Difference	Sum of square	Df	Mean of square	F-value	Sig
Knowledge dimension	Between groups	20.003	4	5.001	27.847	.000
	Within groups	65.724	366	.180		
	Total	85.727	370			
Emotional dimension	Between groups	12.763	4	3.191	20.898	.000
	Within groups	55.883	366	.153		
	Total	68.647	370			

Skills dimension	Between groups	13.070	4	3.268	16.722	.000
	Within groups	71.518	366	.195		
	Total	84.588	370			
Total	Between groups	14.919	4	3.730	24.621	.000
	Within groups	55.443	366	.151		
	Total	70.362	370			

Table 10 shows differences in the first dimension (knowledge), second dimension (emotional), the third dimension (skills), and the total of all aspects, according to the years of study, with a significance value less than 0.05. A Scheffé table is used to find the mean differences between variable categories.

Table 11: Scheffé table showing mean differences between variable categories

Dimension	Category		First	Second	Third	Forth	More
Knowledge dimension		Mean	1.93	2.12	2.30	2.56	2.44
	First	1.93		1.95	0.001**	0.000**	0.000**
	Second	2.12			0.456	0.000**	0.008**
	Third	2.26				0.062	0.351
	Forth	2.56					0.099
	More	2.44					
Dimension	Category		First	Second	Third	Forth	More
Emotional dimension		Mean	1.80	1.89	2.10	2.28	2.18
	First	1.80		0.815	0.002**	0.000**	0.000**
	Second	1.89			0.088	0.000**	0.002**
	Third	2.10				0.096	0.887
	Forth	2.28					0.727
	More	2.18					
Dimension	Category		First	Second	Third	Forth	More
skills dimension		Mean	1.84	2.06	2.19	2.39	2.26
	First	1.84		0.136	0.001**	0.000**	0.003**
	Second	2.06			0.536	0.000**	0.008**
	Third	2.19				0.063	0.999
	Forth	2.39					0.335
	More	2.22					
Dimension	Category		First	Second	Third	Forth	More

Total		Mean	1.86	2.02	2.22	2.41	2.28
	First	1.86		0.253	0.000**	0.000**	0.000**
	Second	2.02			0.217	0.000**	0.032*
	Third	2.18				0.071	0.827
	Forth	2.41					0.473
	More	2.28					

** = significant differences found in year three

Table 11 shows differences for years of study in favor of the higher years. This indicates that technological awareness increases with years of research and gaining experience, thereby growing students' technological awareness in terms of information, emotions, and abilities. In the first-year students, take non-technology general university classes. Therefore, in higher education years, the technical knowledge of students increases.

Table 12: One-way ANOVA test of means by a cumulative average

Dimensions	Difference	Sum of square	FD	Mean of square	F-value	Sig
Knowledge dimension	Between groups	16.458	2	8.229	43.718	.000
	Within groups	69.269	368	.188		
	Total	85.727	370			
Emotional dimension	Between groups	14.162	2	7.081	47.826	.000
	Within groups	54.485	368	.148		
	Total	68.647	370			
Skills dimension	Between groups	14.769	2	7.384	38.922	.000
	Within groups	69.819	368	.190		
	Total	84.588	370			
Total	Between groups	15.112	2	7.556	50.326	.000
	Within groups	55.250	368	.150		
	Total	70.362	370			

Table 12 shows statistically significant differences in the first dimension (knowledge), second dimension (emotional), the third dimension (skills), and the total of all dimensions according to the cumulative average, with a significance level less than 0.05. A Scheffé table is used to find the mean difference between the variable categories.

Table 13: Scheffé table of the mean differences between cumulative averages

Dimension	Category		1-1.9	2-2.9	3-4
		Mean	1.72	2.41	2.39

Knowledge dimension	1-1.9	1.72		0.000**	0.000**
	2-2.9	2.41			0.943
	3-4	2.39			
Dimension	Category		1-1.9	2-2.9	3-4
Emotional Dimension		Mean	1.54	1.17	1.16
	1-1.9	1.54		0.000**	0.000**
	2-2.9	1.17			0.948
	3-4	1.16			
Dimension	Category		1-1.9	2-2.9	3-4
Skills dimension		Mean	1.62	2.27	2.26
	1-1.9	1.62		0.000**	0.000**
	2-2.9	2.27			0.998
	3-4	2.26			
Dimension	Category		1-1.9	2-2.9	3-4
Total		Mean	1.63	2.27	2.28
	1-1.9	1.63		0.000**	0.000**
	2-2.9	2.27			0.967
	3-4	2.28			

** = significant differences found in year three

Table 13 shows the differences between cumulative averages. It is clear from the previous table that there are differences in the level of technological awareness cognitively, emotionally, and in terms of skill, generally in favor of students with the highest rates, who are distinguished academically compared to students with lower academic performance. These distinguished students are keen to achieve all learning outcomes because the university gives educational awards and scholarships to distinguished students.

Table 14: T-test of the means by identity and technological awareness

Dimensions	Variable category	Mean	SD	FD	T-value	Sig
Knowledge dimension	Qatari	2.41	.29	370	0.657	0.512
	Non-Qatari	2.39	.29	370		
Emotional dimension	Qatari	2.44	.31	370	0.380	0.704
	Non-Qatari	2.45	.35	370		
Skills dimension	Qatari	2.31	.36	370	0.676	0.500
	Non-Qatari	2.29	.34	370		
Total	Qatari	2.39	.26	370	0.482	0.630
	Non-Qatari	2.37	.27	370		

Table 14 shows no differences in any dimension according to the identity variable because the University of Qatar emphasizes diversity and equality of educational opportunity for students of different nationalities and cultural backgrounds.

4. Discussions:

Regarding the explanation of the results of the first question about the technological awareness of students of the College of Education at Qatar University, the results of awareness are 2.39 in all aspects and of a high degree. This result can be explained by the fact that the students study technology courses, which increases their technological culture, which gives them a tendency to learn more about technological tools and develop curiosity. The nature of skill acquisition requires time for training and development, for the students' skills to be suitable for deployment in the field.

At the time of the study, the Coronavirus crisis was sweeping the world. These results are consistent with students using e-learning platforms without facing any problems during the crisis. Faculty members could communicate with students remotely because distance learning was part of some of the courses taught at the university.

As for the second question level of technological awareness among students, the overall technological awareness of students in the knowledge dimension had an overall mean of 2.40, with a high degree. This can be explained by the fact that one of the learning outcomes of all courses at the College of Education is integrating technology with education and the use of current and continuously updated methods in the teaching process. Followed with eagerness, the conferences and symposiums ranked as low level because many responsibilities of the students relating to the operation of academic achievement and testing reduce their opportunities to follow up on conferences related to the subject of Technology.

The level of technological awareness of students in the emotional dimension had a total mean of 2.44; with a high degree, this result is not surprising because students are taught at university the ethics of the teaching profession. The seventh of the College of Education outputs is the application of professional values in the educational environment. In addition, the university provides all students free access to the computer programs they need during their studies through the university platform.

However, item 19, which says, "I prefer to use new technologies at only one stage of the lesson if I have to," ranked last, with a moderate degree. This indicates that students prefer to employ Technology at all stages of the lesson and not just a specific part. This was one of the negative phrases in the study tool to reveal the credibility of students' responses to the tool.

The level of technological awareness of students in skill dimension had an overall mean of 2.31, with a moderate degree. This result can be attributed to educational sites being the most common in use and free of charge. At the university, students are given assignments to search for popular sites in their specializations. There are courses for students to learn how to design educational websites and graduation projects. Students are required to design an electronic lesson and implement it in the field, based on the many educational sites related to their specialization. About item 49, having the skills to use various statistical and data analysis software in the curriculum topics ranked last, with a moderate degree. The reason for this result is that there are no courses in the College of Education that teach the basics of educational statistics.

As for the third question of the study regarding any statistically significant differences in the level of technological awareness between students based on gender, identity, cumulative average, specialization, type of programme and number of years of study, study shows no statistically significant difference in any dimension according to gender, this can be explained by the university educational programs taking into

account the needs of both parties and the implementation of quality standards, particularly as Qatar University separates education between men and women in accordance with the culture of the country. At the same time, s results show a slight difference in favor of the primary program in the first dimension (knowledge) and the second dimension (emotion) over the secondary program, because there are some courses specializing in Technology, such as the Technology for children, which is compulsory for all primary specialization students.

As for the type of specialization, the results show no statistically significant difference in any dimension according to specialty. This lack of distinction is explained by the Technology being integrated with all courses equally. Recently, Qatar University abolished education technology specialization, and Technology was combined with other education pathways. At the same time, the results showed differences in all dimensions and in the total dimensions as a whole, according to the years of study, in favor of the higher years. In general, this shows that the growth of technological awareness is cumulative, meaning the technological awareness of students in terms of knowledge, emotion, and skill increases with years of study and cumulative experience. In the first year, students study general university courses not related to Technology. Accordingly, the technological awareness of students increases in higher academic years.

With regard to the level of academic achievement, it is clear that gaps in technical skills are recognized in terms of perception, emotion, and competence, usually in favor of high-grade students. They differ academically from students with lower academic results. These distinguished students participate in obtaining all learning outcomes, as the university awards outstanding students with educational awards and bonds.

With regard to the difference in nationality and its impact on the acquisition of technological capabilities, there are no differences between nationalities, because the education system in Qatar is a fair system that deals with all students at the same level and provides services to all without any discrimination, which reinforced the lack of existence between the research samples

5. Conclusions:

This study indicates that students at the College of Education at Qatar University have a high awareness of Technology, both emotional and cognitive, and an average level of awarness of Technology in term of skill, regardless of gender, specialization, or nationality. The results of this study are consistent with studies of (Stocklmayer & Gilbert 2002) (Potts, 2012) and (Chaman & Dahiya, 2016). On achieving technological awareness of students and its importance in learning

In addition, these study results are consistent with a study of (Azikiwe, Obidike, Enemou 2011) which confirmed that using technological tools increase and support students learning.

The study reveals that technological awareness increases with an increase in the years of study and the level of academic performance. There are slight differences in favor of the primary program in the first dimension (knowledge) and the second dimension (emotion) over the secondary program, these results are consistent with a study of (Al-shewieli 2018) that conducted to find the level of technical awareness social studies teachers and its relation to digital citizenship. The results show that some variables do not affect, such as specialization and scientific qualification. While the results of this study disagreed with the results of the current study if it was verified that, there was a gender impact on students' acquisition of skills related to technological awareness, on the other hand, the study results show a high level of technological awareness in the knowledge and skill domains which consistent with the current study.

The results of the current study constant with the outcome of (Kansarah2010) that show the level of technological culture among students was relatively good, with differences of statistical significance by GPAs, and disagree with Kansara's study results regarding the gender.

6. Recommendations:

Based on these results, the study recommends that the College of Education hold workshops and seminars specializing in the field of Technology and develop a mechanism to inform students of this so that the most significant number of students can attend. Moreover, the college could add a course on statistics in education to the list of compulsory subjects or hold training workshops on the subject.

Another recommendation is to add a course in education technology, for students in the secondary education program in particular, and courses in Technology for first-year students. In the long term, the study recommends that researchers conducted the level of technological awareness of faculty members in universities and into technological awareness among students of other colleges at Qatar University.

The researcher suggests that all students be trained and informed about the developed procedures, activities, and assessment methods by integrating Technology into teaching and learning. And they are making technology an integral part of the study plan materials that are perpetuated by students during the study and before they are sent to the field for training, in other words, empowering students to integrate Technology while studying at the university and before field training.

References:

Ahmad, F. (2008). *A proposed program in technological education to develop technological awareness and some skills for dealing with modern technology applications among high school students*. Unpublished Ph.D. thesis at Banha University, Arab Republic of Egypt

Al-Mohammed, A. (2019). *The factors influencing the values of digital citizenship among secondary school students in the Mafraq governorate from teachers*. Unpublished Masters' thesis, College of Education, Al Al-Bayt University, Jordan.

Al-shewieli, M. (2018). *The technological awareness of social studies teachers in the first directorate of Irbid and its relation to digital citizenship*. Unpublished Masters' thesis, College of Education, Al Al-Bayt University, Jordan.

Anunobi, V.N. (2015). A Study of the Information and Communication Technology use among student-teachers in universities in North Central Nigeria. *Order 5*(1), 106–112.

Bindu, C.N. (2017). Attitude towards and Awareness of Using ICT in classrooms: A Case of expatriate Indian teachers in UAE. *Journal of Education and Practice, 8*(1), 10–17.

Chaman, V., & Sanjay, D. (2016). Gender difference towards information and communication technology awareness in Indian universities.*Springer Plus 5*(1). https://doi.org/10.1186/s40064-016-2003-1

Khalaf Allah, M. (2016). The comparison effect of the using the traditional cooperative learning and using the collaborative learning in electronic forums in the development of the knowledge and the practical sides of technological awareness among students of the Faculty of Education. *Journal of the Federation of Arab Universities for Education and Psychology - Syria, 14*(3), 275-310.

Malik, M., Khan, H., Gholamzadeh, C., Abdou, M., Goni, F., Klemes, J., & Alotaibi, Y. (2019). Investigating Students' Sustainability Awareness and the Curriculum of Technology Education in Pakistan. *Sustainability, 11*, 1-18. https://doi.org/10.3390/su11092651

Mcgowan, P., Cooper, S., Durkin, M., & O'Kane, C. (2015). The Influence of Social and Human Capital in Developing Young Women as Entrepreneurial Business Leaders. *Journal of Small Business Management, 53*, 645–661. https://doi.org/10.1111/jsbm.12176

Meerza, A., & Beauchamp, G. (2017). Factors influencing undergraduates' attitudes towards ICT: An empirical study in Kheis. *Turkish Online Journal of Educational Technology, 16*(2), 35–42.

Muehlhauser, L. (2015). *Intelligence Explosion FAQ*. Machine Intelligence Research Institute.

Nagasubramani,P.C., & Raja,R.(2018). Impact of modern technology in education. *Journal of Applied and Advanced Research, 3*(1), S33-S35. https://doi.org/10.21839/jaar.2018.v3is1.165

Obidike, N.D., Anyikwa, N., & Enemou, J.O. (2010). Teachers' Awareness of the Existence and the Use of Technology to Promote Children's Literacy Instruction. *African Journal of Teacher Education, 1*(1), 115-125. https://doi.org/10.21083/ajote.v1i1.1576

Potts, D.T. (2012). A Companion to the Archaeology of the Ancient Near East. Blackwell. https://doi.org/10.1002/9781444360790

Stocklmayer, S., & Gilbert, J. (2002). New experiences and old knowledge: Towards a model for the personal awareness of science and Technology. *International Journal of Science Education, 24*(8), 835-858. https://doi.org/10.1080/09500690210126775

Tormo-Carbó, G., Seguí-Mas, E., & Oltra, V. (2018). Business Ethics as a Sustainability Challenge: Higher Education Implications. *Sustainability*, 10, 2717. https://doi.org/10.3390/su10082717

Vinnaras Nithyanantham and N. Rekha(2020). Attitude and Awareness towards Information and Communication Technology of Student Teachers, International Journal of Psychosocial Rehabilitation 24(5):2585-2591. DOI: 10.37200/IJPR/V24I5/PR201958

Wang, L.C., & Calvano, L. (2013). Is Business Ethics Education Effective? An Analysis of Gender, Personal Ethical Perspectives, and Moral Judgment. Journal of Business Ethics, 126, 591–602. https://doi.org/10.1007/s10551-013-1973-y