The Status of Information and Communication Technology (ICT) of Omani and Iranian Fourth-Grade Students

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Abstract **- The present research paper is a comparative study between Omani and Iranian students to find out the status of the usage of Information and Communication Technology (ICT) among Omani and Iranian fourth-grade students who participated in the Trends in International Mathematics and Science Study (TIMSS) in 2015. The statistical samples have been selected from all Omani and Iranian fourth-grade students who participated in the TIMSS 2015 assessment. The research design followed a secondary analysis approach and the cluster sampling method was applied for sampling purposes. There were 9105 (4524 girls; 4581 boys) and 3823 (1863 girls; 1960 boys) from Oman and Iran respectively that have been selected as statistical samples. The findings revealed that Omani and Iranian students' ICT usage status was low. However, Omani students' ICT usage status (M=29.67, SD=1.17) showed a greater portion than Iranian students' (M=14.76, SD=5.39). Furthermore, Omani and Iranian boys' ICT usage status was greater than girls. Consequently, a significant relationship between students' access to ICT facilities with their achievement rate was found for both Iranian and Omani students (Oman: r=0.022, sig=<0.05; Iran: r=0.210, sig=<0.01).**

Index Terms **- ICT, TIMSS, Mathematics, ICT Accessibility.**

INTRODUCTION

Technology-based learning is becoming a significant part of primary and higher education across the world. The application of technology in the teaching-learning process has shown its advantages in providing an interacting learning environment for learners (Tuzlukova et al., 2016). Modern educational and communication environments could facilitate appropriate, effective, and pleasant learning spaces for students as well as teachers to experience a thrilling interaction during the teaching-learning process. Recently, technology-based learning is being applied as the most essential tool and method to make education more effective and attractive for learners in many countries. Furthermore, it is not far away that multimedia tools will be a faultless alternative educational tool in educational schemes of many countries. Educational technology in practice depends on designing and evaluating curricula, educational experiences, implementation, and redefinition. In other words, educational technology could be identified as a principled and logical system to explain educational problems and curriculum design through accompany of a systematic and practical approach. Kozma (2008) stated, that the rapid changes in every aspect in the 21st century, illustrate that the policies and decisions of education should be revised along with these changes. Since education has a considerable impact on the economy and social development, in a short view, this effect would be noticeable in the developed countries which have truly focused on their educational policies. The advancement of information and communication technology and its impacts on the

teaching-learning process have provided countless opportunities for creating a learning environment with formative, interesting, interactive, efficient, flexible and meaningful educational strategies. Moreover, educational planners and teachers should replace traditional learning and memorization methods with motivating materials through the utilization of Information and Communication Technology (ICT) (Rahman Doust & Husain, 2021). Besides, the application of ICT for educational purposes has been more focused recently by many researchers to challenge its effect on students learning process. As a report by the Europe Commission, these kinds of technologies cannot bring any changes to students' creativity, knowledge, and motivation without providing an assessment system to assess their impact on learning (González, 2021).

The present paper aims to compare the status of ICT usage among Omani and Iranian fourth-grade students.

OBJECTIVES

1. To study Iranian and Omani students' ICT usage status.
2. To study the difference between boys' and girls' ICT usage status among Omani and Iranian students.
3. To study the relationship between students' accessibility to ICT facilities and their achievement rate in the TIMSS 2015 mathematics.

RELATED STUDIES

The advantages of ICT in education and the countries' policies towards the application of ICT on educational issues have been reviewed in many studies. Khan et al. (2012) pointed out that the application of ICT has great potential and effect on educational achievements and it can transform the educational information to create fundamental knowledge patterns in the teaching-learning process. In a study by Al Musawi (2010) on the education system of Oman, he reported that the OSET's has exposed some major goals for promoting the ICT which are listed as follows: 1. To promote and conduct research studies regarding the impact of ICT in Oman and Gulf countries, 2. to involve the society in promoting culturalization of the ICT application among Omani people. Furthermore, UNSECO (2013) reported that the Gulf countries, especially Oman have released fundamental educational plans to promote ICT programs at all educational levels (primary, lower secondary, and upper secondary). In other words, Omani students have been trained to improve their computer skills at primary levels. Al-Senaidi et al. (2009) stated that Oman started to expand and develop the usage of ICT in its education system either in primary schools or higher education. Sahidi et al. (2017) showed that the application of ICT in teaching did increase teachers' satisfaction rates. Nourabadi (2020) stated that for potentializing students' creativity level, everyone must get involved in the education system to be worth creativity and innovative thinking and the instructors should consider students' creativity and innovative thinking in teaching-learning activities. Al Musawi (2007) suggested for expanding ICT usage, is needed to make it accessible for all people and should be available at a very cheap price. However, to promote the application of technology among students, human resources and technical instructors should get considered vital factors. Hamidi et al. (2010) pointed out that Iran's educational policies should be amended and a technology-based system should be designed to promote the application of ICT among students. Furthermore, N. Al-Qaysi et al. (2019) conducted a study on Omani students' attitudes towards the application of technology in education activities. The results showed that the application of social media does not have a considerable effect on students' attitudes toward respecting their age, gender, and study year. Hence, this study concluded that all students of this study were interested in the application of technology in the teaching-learning process. Touray et al. (2013) illustrated that there are some important factors of the ICT barriers. They revealed that, lacking an internet exchange point could be listed as the most essential barrier to the ICT application. The internet issues cause the usage of ICT in various aspects, especially in the teaching-learning process. However, some other factors such high cost of the internet is identified as a barrier to promoting the application of ICT in the teaching-learning process. Taleb & Hassanzadeh (2015) indicated that the usage of technology in mathematics teaching can provide a motivational learning environment and mathematics problems could be learned easier. Park & Weng (2020) analyzed 9th-grade students' PISA 2015 achievement data. They showed that ICT-related factors can affect students' academic achievements. Furthermore, the

results indicated that students were interested in using ICT in the teaching-learning process. Zhang & Liu (2016) conducted a research study on the PISA data from the 2000 to 2012 assessment. The results of the study revealed that the usage of ICT does not have any effects on students' achievements in mathematics. However, many research studies have focused on the usage of ICT and its association with students' achievements (Song and Kang 2012; Wainer et al. 2008; Luu and Freeman 2011; Spiezia 2010, ac cited in Zhang & Liu, 2016). Carrillo et al. (2011) showed, that computer-aided educational programs for teaching mathematics subjects were able to provide high scores for children who received these instructions. Furthermore, the study suggested that ICT programs have high effects on students' achievements in mathematics. Saal et al. (2019) showed that the students who were taught mathematics through computer and ICT-based teaching methods showed higher performance than the students who were not taught mathematics by computer-based methods.

Najafi et al. (2016) in their study showed that Iranian students' access to ICT facilities was moderate (in Semnan province). Hence, according to teachers' and principles' opinions, the major reason for the less application of the ICT was related to economic issues. However, there were some other barriers such as cultural, educational, and ethical issues.

METHODOLOGY

The present study is known as a descriptive-correlational research approach. In other words, the research study has focused on two dimensions. The first part of the research aims to offer descriptive information on the participants' demographical factors, sample size, and their ICT usage during studying in the fourth grade. The second part of the study attempts to find out an association between students' accessibility to ICT facilities with their achievement rate in TIMSS mathematics assessment.

Population and Sample

The sampling procedure and estimating sample size for the present study followed the TIMSS sampling method which was the cluster sampling approach. The statistical samples have been selected from Omani and Iranian fourth-grade students who participated in the Trends in International Mathematics and Science Study (TIMSS) 2015 mathematics. Therefore, Omani students' sample size was reported as 4524 girls (49.7%) and 4581 boys (50.3%). Moreover, there were 1863 girls (48.7%) and 1960 boys (51.3%) from Iran.

Data Collection Tools

The research tools for collecting the data were the TIMSS student and school questionnaires which were designed by the TIMSS assessment. However, the structure of the questionnaires has been modified by the researchers. In other words, the questionnaires were re-coded by the researchers for scoring purposes in this study. Additionally, 9 items from the student's questionnaire and 5 items from the school questionnaire were finalized for data collection. The structure of the tools has been described in table 1.

Table 1 Students' ICT usage tool

Type of scale	Scale	Student's tool	School's tool	Total
Demographically	Gender	1	0	1
2 point	Yes / No	5	0	5
4 point	Likert	3	5	8
Total Options		9	5	14

*Scoring of the Research Tools*As the research tools have been modified by the researchers, therefore, the scoring procedures of the tools should be explained clearly. There were two-point items (yes/no), and four-point items that followed the Likert scale scoring structure. Particularly, the structure of the scoring has been illustrated in table 3 and table 4.

Table 2 Scoring of ICT Items

Type of scale	Yes	No
2 point	1	0

Table 3 Scoring of ICT Items

Type of scale	Every day or almost every day	Once or twice a week	Once or twice a month	Never or almost never
4 point	4	3	3	1

Tables 2 and 3 indicate the scoring method of the students' ICT usage tools which have been modified by the researchers. The items' scores have been re-coded as it has been explained in table 3.

DATA ANALYSIS PROCEDURE

To analyze the collected data descriptive and inferential statistics were applied for finding out students' ICT usage status. Hence, to calculate the frequencies and statistical mean of the ICT-related devices that the students used for their homework and learning purposes, descriptive statistics were used. To analyze the first research objective, the one-sample t-test was applied. The reason behind using the one-sample t-test was to compare a group's statistical mean with a standard mean which in this case, the students' ICT usage status was compared with the average statistical mean of ICT usage of the participating countries in the TIMSS assessment. Hereafter, for analyzing the second research objective, the t-independent test was applied. The t-independent test applies to comparing two independent groups' statistical means. Therefore, to compare boys' and girls' statistical mean, the t-independent test was used. The third research objective was aimed to find out the relationship between students' accessibility to ICT facilities with their achievement rate in the TIMSS mathematics. Therefore, the spearman-rank correlation analysis was applied.

RESULTS

Descriptive Findings

Students' ICT usage

To find out Omani and Iranian students' ICT usage status, the descriptive statistic was used. Table 4 explains the outputs of the descriptive analysis.

Table 4 Students' ICT usage

Own Computer /Laptop				
Oman			Iran	
	Frequency	Percent	Frequency	Percent
No	3648	40.2	1534	41.4
Yes	5433	59.8	2169	58.6
Total	9081	100.0	3703	100.0
Sharing Computer /Tablet				
Oman			Iran	
	Frequency	Percent	Frequency	Percent
No	3340	36.8	1846	50.9
Yes	5741	63.2	1778	49.1
Total	9081	100.0	3624	100.0
Internet Connection				
Oman			Iran	
	Frequency	Percent	Frequency	Percent
No	3655	40.2	2040	55.0
Yes	5426	59.8	1672	45.0
Total	9081	100.0	3712	100.0
Own Cellphone				
Oman			Iran	
	Frequency	Percent	Frequency	Percent
No	5863	64.6	2214	59.5
Yes	3218	35.4	1507	40.5
Total	9081	100.0	3721	100.0
Gaming System				
Oman			Iran	
	Frequency	Percent	Frequency	Percent
No	3677	40.5	2266	60.8
Yes	5404	59.5	1459	39.2
Total	9081	100.0	3725	100.0

The details of table 4 show that out of 9081 Omani students, 3648 (40.2%) stated, that they do not have a personal computer or laptop and 5433 (59.8%) answered that they have a personal computer or laptop. Furthermore, out of 3703 Iranian students, 1534 (41.4%) responded that they do not use a personal computer or laptop and 2169 (58.6%) answered, that they use a personal computer or laptop for educational

purposes. Besides, 3340 (36.8%) Omani students responded that their computer or tablet is not a sharing device with other family members, and 5741 (63.2%) answered that their computer or tablet is a common device with other family members. Moreover, 1846 (50.9%) of Iranian students stated, that they do not have a sharing device and 1778 (49.1%) individuals stated their device is a shared device with other family members. Whereby, the status of students' accessibility to an internet connection for both Iranian and Omani students showed that 5426 (59.8%) of Omani students had accessibility to the internet connection, and 3655(40.2%) of students did not have an internet connection. However, the status of internet connection for Iranian students showed, that 1672(45%) of students had accessibility to the internet connection and 2040 (55%) of them did not have access. Students were asked about whether they have a personal cellphone or not, the received responses from Oman showed, that 3218 (35.4%) of students had a cell phone and 5863 (64.6%) of them did not have one. Meanwhile, 1507 (40.5%) of Iranian students responded they have a cellphone, and 2214 (59.5%) of the respondents answered, that they do not have one. Consequently, 5404 (59.5 %) of Omani students stated they have a gaming system, while 3677 (40.5 %) of them responded they do not have a gaming system. Furthermore, 1459 (39.2 %) of Iranian students responded that they have a gaming system, and 2266 (60.8 %) of them said they do not have one.

Figures 1 and 2 are presented below to describe better the students' ICT usage of Omani and Iranian students.

Figure 1 Omani Students' ICT Usage

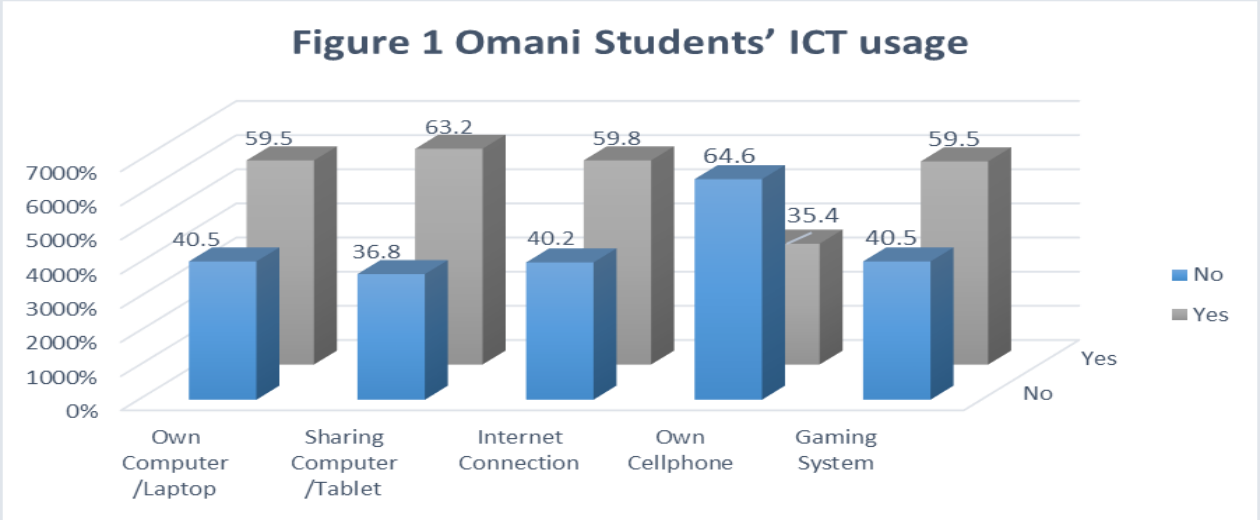
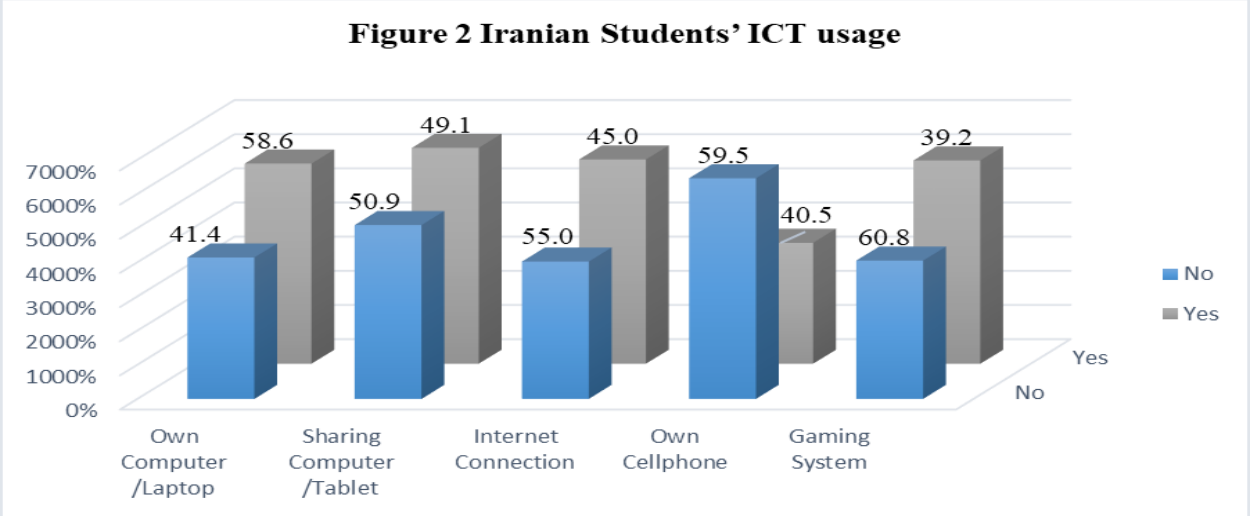


Figure 2 Omani Students' ICT Usage



ICT Usage Status According to Gender

To find out the students' ICT usage status according to gender factor, boys' and girls' statistical mean was compared with each other. Tables 5 and 6 demonstrate the boys' and girls' ICT usage status.

Table 5. Describes the Status of ICT Usage between Omani Boys and Girls.

Omani Boys' and Girls' ICT Usage Mean						
Sex of Student		Own Computer /Laptop	Sharing Computer /Tablet	Internet Connection	Own Cellphone	Gaming System
Girl	Mean	5.8	6.5	5.8	2.8	5.2
	Percent	49.7%	49.7%	49.7%	49.7%	49.7%
	N	4513	4513	4513	4513	4513
	Std. Deviation	4.0	4.8	4.9	4.5	5.00
Boy	Mean	6.2	6.2	6.1	4.3	6.7
	Percent	50.3%	50.3%	50.3%	50.3%	50.3%
	N	4568	4568	4568	4568	4568
	Std. Deviation	4.9	4.9	4.9	4.9	4.7
Total	Mean	6.0	6.3	6.0	3.5	6.0
	Percent	100%	100%	100%	100%	100%
	N	9081	9081	9081	9081	9081
	Std. Deviation	4.90	4.82	4.90	4.78	4.91

Table 5 and figure 3 indicate that Omani boys' statistical mean was greater than girls' in all dimensions. However, sharing a device or laptop portion was greater for girls. In other words, Omani girls used sharing laptops or computers for educational purposes more than boys (Girls: M=6.5; Boys=6.2). Hence, Omani boys' mean of using a personal cellphone was greater than girls. It indicates that gender equality in using ICT facilities among Omani families could flag towards the male.

The presented information in table 6 and figure 4 illustrate that Iranian boys' accessibility to the ICT facilities was higher than girls. Hence, the boys' mean was greater than girls' in having a personal computer or laptop (girls= 5.3' boys=6.3). Moreover, Iranian boys students' accessibility rate to the ICT facilities also showed a higher accessibility portion than girls. Consequently, to make a comparison between Omani boys' and girls' ICT status with Iranians, it would be concluded that 49.7% of Omani girls had a personal computer while this portion was 48.6% for Iranian girls. However, this amount for Omani and Iranian boys was 50.3% and 51.45% respectively. Hence, 49.7% of Omani girls and 48.6% of Iranian girls had a sharing computer.

Moreover, the internet connection proportion was 49.7% and 48.9% for Omani and Iranian girls respectively. The internet connection accessibility for Omani and Iranian boys showed, 50.3% and 51.1% correspondingly.

Figure 3 Omani Boys' and Girls' ICT Usage Statistical Mean

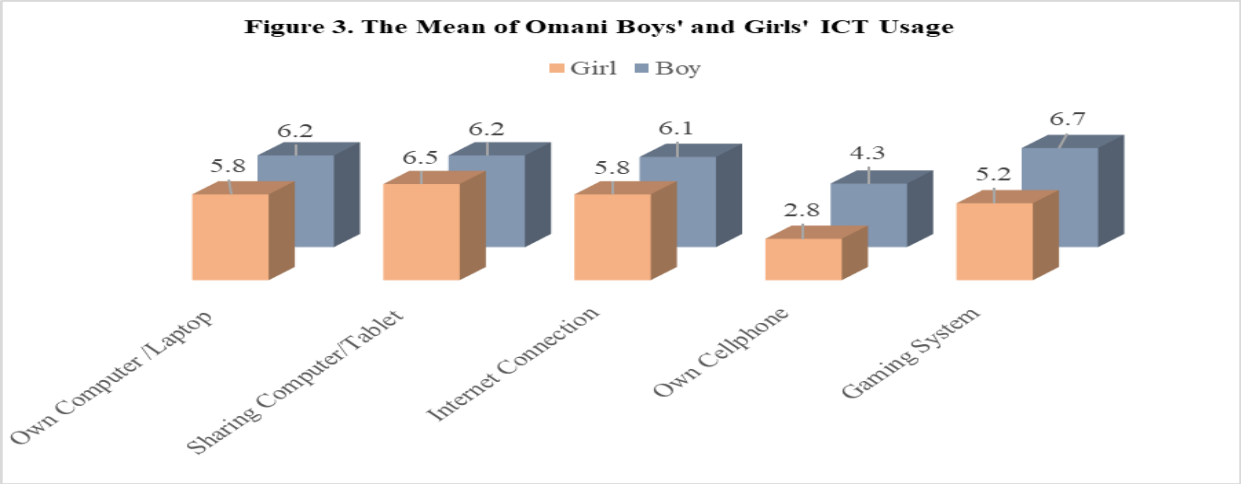
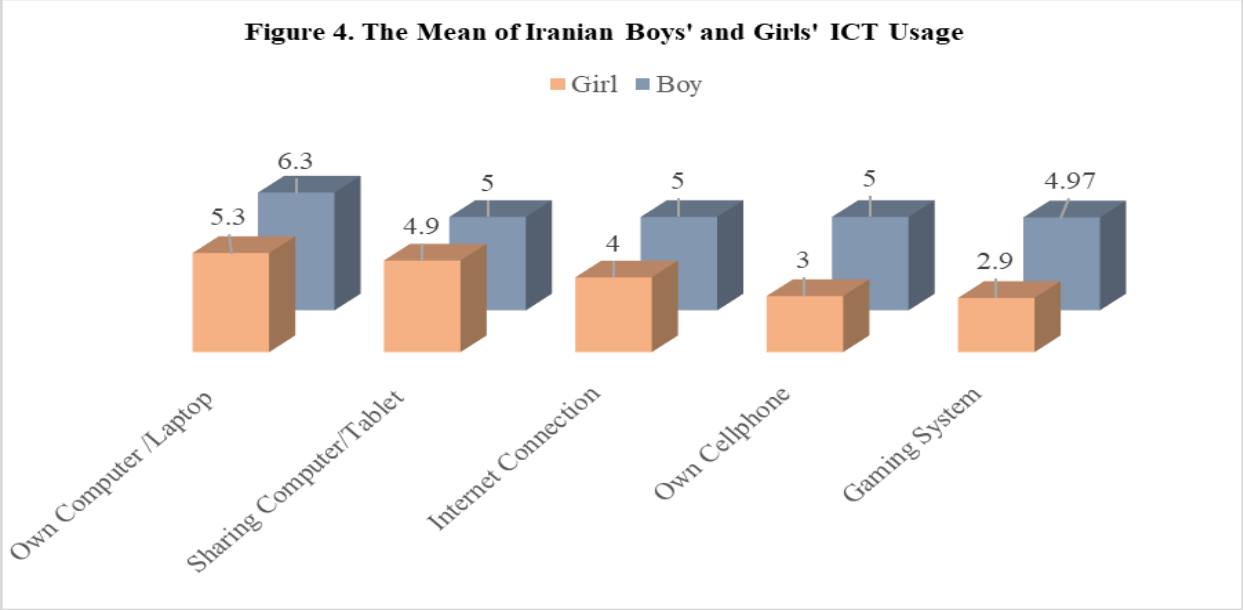


Table 6 Describes the Status of ICT Usage between Iranian Boys and Girls.

Iranian Boys' and Girls' ICT Usage Mean						
Sex of Student		Own Computer /Laptop	Sharing Computer /Tablet	Internet Connection	Own Cellphone	Gaming System
Girl	Mean	5.3	4.9	4.0	3.0	2.9
	Percent	48.6%	48.6%	48.9%	48.6%	48.6%
	N	1799	1760	1814	1809	1811
	Std. Deviation	5.0	5.0	4.9	4.6	4.5
Boy	Mean	6.3	5.0	5.0	5.0	4.9
	Percent	51.4%	51.4%	51.1%	51.4%	51.4%
	N	1904	1864	1898	1912	1914
	Std. Deviation	4.8	5.1	5.0	5.0	5.0
Total	Mean	5.9	4.9	4.5	4.0	3.9
	Percent	100%	100%	100%	100%	100%
	N	3703	3624	3712	3721	3725
	Std. Deviation	4.9	5.0	5.0	4.9	4.9

Figure 4 Iranian Boys' and Girls' ICT Usage Mean



Furthermore, the percent proportion for having a personal cellphone was found 49.7 % and 48.6% for Omani and Iranian girls respectively, while this proportion for boys indicated 50.3% and 51.4% for Omani and Iranian students. Consequently, 49.7% of Omani and 48.6% of Iranian girls had accessibility to a gaming system. This amount for Omani and Iranian boys was shown as 50.3% and 51.4% respectively.

RESEARCH QUESTIONS

$H_0 1$. Omani and Iranian students' ICT usage status is the same with the average rate of ICT usage status among participating countries.

The null hypothesis claims that Omani and Iranian students' ICT usage status is the same with the average usage among the participating countries' students in the TIMSS 2015. Table 7 represents one-sample t-test outcomes of Omani and Iranian students' ICT usage for teaching-learning purposes. The test value (test value=50) was calculated from the average usage of the ICT among participating countries in the TIMSS mathematics assessment which was obtained from the average usage of ICT among participating countries (exhibit 8.8, Mullis et al, 2016). The Omani and Iranian students' statistical mean and standard deviation are presented respectively: (M=29.76; SD=1.17); (M=14.76; SD= 5.38).

Table 7 One sample t-test analysis

	Test Value = 50								
ICT	N	M	SD	t	df	Sig	M.D	L	U
Oman	9105	29.67	1.17	-1657.58	9104	.000	-20.33	-20.35	-20.31
Iran	3823	14.76	5.39	-403.94	3822	.000	-35.24	-35.41	-35.07

As presented in table 7, the statistical mean of Omani students' ICT usage (M=29.67) was lower than the test value (t-value=50; M<t). In other words, Omani students' ICT usage was below the average usage rate among the participating countries in the TIMSS mathematics assessment. Therefore, the null hypothesis is rejected ;(M=29.67; sig=<0.05). Furthermore, the Iranian students' ICT usage mean (M=14.76) was compared with the test value (t-value =50). The outcomes showed that the Iranian students' ICT usage mean was lower than the test value (t-value=50; M<t). Hence, the null hypothesis is rejected (M=14.76; sig= <0.05).

However, the Omani students' ICT usage status was greater than Iranian students (Omani students' ICT mean=29.67; Iranian students' ICT usage mean= 14.76).

$H_0$2. There is no significant difference between boys' and girls' ICT usage status among Omani and Iranian students.

To compare boys' and girls' ICT usage statistical mean, the t-independent test was applied. The null hypothesis assumes that there is no statistically significant difference between boys' and girls' ICT usage for both Omani and Iranian students. Table 8 indicates the t-independent test outcomes of boys' and girls' ICT usage status.

Table 8 the status of ICT between boys and girls

ICT		N	M	SD	t	df	Sig	L	U
Oman	Girls Boys	4524 4581	29.64 29.70	1.16 1.18	-2.36	9103	.018	-0.11	-0.01
Iran	Girls Boys	1863 1960	13.70 15.77	5.23 5.36	-12.07	3821	.000	-2.40	-1.73

The mean and standard deviation of Omani boys and girls are respectively (Boys: M=29.70, SD=1.18; Girls: M= 29.64, SD=1.16). The presented information in table 8 indicates that there is a significant difference between Omani boys' and girls' ICT usage, (t=-2.36, df=9103, sig=<0.05). Hence, boys' ICT usage status was greater than girls. Furthermore, Iranian boys' and girls' mean and standard deviation are respectively, (boys: M=15.77, SD=5.36; girls: M=13.70, SD=5.23). The results of the t- independent test reveal that there is a significant difference between Iranian boys' and girls' ICT usage status, (t=-12.07, df=3821, sig= <0.05). Consequently, both Omani and Iranian boys' ICT usage status was greater than the girls'. Therefore, the null hypothesis is rejected for both Omani and Iranian students' ICT usage.

$H_1$3. There is a significant relationship between students' access to ICT facilities with their achievement rate in the TIMSS mathematics assessment for both Iran and Oman.

To find out the relationship between students' ICT usage with their achievement rate in the TIMSS mathematics assessment, the Spearman rank correlation coefficient was used. Since both variables were ordinal (mathematics achievement and ICT usage) the Spearman rank correlation is the best method to run a correlation test between the predictor and outcome variables.

The outcomes of spearman rank correlation have been presented in table 9.

Table 9 Spearman's rank correlation coefficient

Spear Rank Correlation Coefficient			
ICT with Mathematics Achievement	N	r	Sig.
Oman	9105	.022**	.033
Iran	3823	.210**	.000

As indicated in table 9, the amount of correlation coefficient between Omani students' ICT usage with their mathematics achievement is presented as follows: $P < 0.05$, r: 0.022; and the amount of correlation between Iranian students' ICT usage with their mathematics achievement rate is presented as $P < 0.01$, r: 0.21. Therefore, it would be pointed out that there is a positive relationship between predictor and outcome variables for Omani and Iranian students. However, the amount of correlation did not show the same amount for both countries. The relationship between ICT usage with mathematics achievement of Omani and Iranian students indicated that Iranian students' correlation was higher than Omani students. The research hypothesis is accepted.

CONCLUSION

The present study aimed to find out the ICT usage status among Omani and Iranian fourth-grade students who participated in the TIMSS 2015 mathematics. The results of the analysis have been discussed below.

Descriptive Results of Students' ICT usage Status

The students' ICT usage has been defined as the students' accessibility to computers, mobile devices, and internet connections for education purposes. To collect data, the TIMSS student and school questionnaires were applied. Students' access to a laptop/computer, cellphone, internet connection, and gaming system were the factors to assess the students' ICT usage status.

Own Computer /Laptop or Sharing Computer or Laptop

The proportion of Omani and Iranian students' access to a personal computer or laptop revealed that 59.8% of Omani students had a personal laptop or computer while 58.8% of Iranian students stated that they use a personal computer. Moreover, 63.2% of Omani students stated they use a sharing computer /laptop with family members, while this proportion was 49.1% for Iranian students. Therefore, Omani students' accessibility status to a personal computer was better than Iranian students.

Accessibility to Internet Connection

The internet connection accessibility status showed that 59.8 % of Omani students had accessibility to an internet connection, whereas only 45.5% of Iranian students had access to an internet connection. Hence, Omani students' accessibility to internet connection was greater than Iranian.

Accessibility to a Personal Cellphone

The analysis outcomes showed that Iranian students' accessibility to a personal cellphone (40.5%) was higher than Omani students' (35.4%).

Accessibility to Gaming System

The results revealed that 59.5% of Omani students had a gaming system while 39.2% of Iranian students stated that they have a gaming system. Therefore, Omani students' accessibility to a gaming system was better than Iranian.

Descriptive Results of Students' ICT usage Status According to the Gender Factor

The results showed that Omani girls' accessibility to a personal computer was better than Iranian (Omani girls=49.7%; Iranian girls=48.6%). Overall, Iranian boys' accessibility to a personal computer was greater than Omani students. Furthermore, 49.7% and 50.3 % of Omani boys and girls and 48.6% of Iranian girls, and 51.4% of boys said their computer is a sharing computer with family members. Hence, a higher proportion of Omani girls had a sharing computer which Iranian girls' status was greater than Omani girls. In other words, boys' status was better than girls in both countries. Consequently, the Omani girls' accessibility status to internet connection was better than Iranian girls, but Iranian boys' status was greater than Omani boys. However, boys' access was higher than girls in both countries. Hence, Omani girls' accessibility to a cellphone (49.7%) was higher than Iranian girls (48.6%). Nevertheless, Iranian boys' percentage was greater (51.4%) than Omani boys (50.3%). In conclusion, Omani girls' status was better than Iranian girls in having a gaming system while Iranian boys' status was greater than Omani (51.4%; 50.3%0. Consequently, in all dimensions, boys' ICT status was superior to girls among Omani and Iranian students.

Omani and Iranian ICT Usage Status

The findings showed that Iranian and Omani fourth-grade students' ICT usage status was below the average rate among participating countries in the TIMSS 2015 mathematics. However, Omani students'

ICT status was greater than Iranian. Furthermore, boy students' ICT usage status was better than girls among Omani and Iranian students based on gender. Iranian students' findings are in line with Najafi (2016) & Hamidi et al (2010). Hence, Omani students' findings are in line with Al-Senaidi et al (2009) & UNSECO (2013).

Association between ICT Facilities with Students' Mathematics Achievement

The results of the Spearman rank correlation revealed that the school's facilities and infrastructures had a positive association with students' achievement in TIMSS 2015 fourth-grade mathematics test. However, the amount of the correlation between ICT facilities with students' achievement rates was higher for Iranian students than Omani students. These results are in line with Saal et al (2019), Park & Weng (2020), Sahidi et al. (2017), Khan et al (2012), and Taleb & Hassanzadeh (2015). However, the findings are in contrast with N. Al-Qaysiet al (2019).

EDUCATIONAL RECOMMENDATION

The usage of ICT and its effects on teaching-learning should be considered more. Educational policy-makers along with instructors should provide and design a country-wide ICT-based learning program to expand the use of ICT among students. Moreover, appropriate instructional materials should be provided to promote the application of ICT, and also an assessable method to evaluate the ICT application-based instructions should be developed.

IMPACT ON THE SOCIETY

The results of this study will be able to motivate parents and teachers to understand clearly the impact of the ICT in the teaching-learning process and to acquire the awareness of the issues in society that should be managed by implication of the educational decision and practical instructions for promoting ICT culture.

FUTURE RESEARCH

The educational researchers should conduct more studies with a special focus on the ICT facilities, the availability of ICT trainers (human resources), the rate of ICT facility distribution in schools, and the culture of the application of ICT in teaching-learning among patents as well as teachers.

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